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Europe Report

SCIENCE AND TECHNOLOGY

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EUROPE REPORT

SCIENCE AND TECHNOLOGY

WEST EUROPE

METALLURGICAL INDUSTRIES

AERITALIA BROADENS SCOPE, CONSIDERS PARTICIPATION IN AIRBUS

Paris L'USINE NOUVELLE in French 10 Apr 86 pp 46-47

[Article by special correspondent in Italy Jean-Pierre Casamayou: "Aeritalia Spreads its Wings"]

[Text] Its policy of cooperation in all directions and its technological experience place the Italian company in a strong position to negotiate its entry into Airbus Industry.

Airbus Industry's call for new partners was well received on the other side of the Alps. An Aeritalia delegation was sent to Toulouse where it was shown the new A330 and A340 in order to find possibilities for a concrete participation. The company sees this as a good way to continue its expansion through another cooperation agreement. Negotiations, however, promise to be difficult. "We are a very aggressive company," Renato Bonifacio, the Aeritalia president, likes to say. His partners and competitors know what he means.

Since it has become one of the big names in the world aerospace industry, Aeritalia deals as an equal with leading companies. It no longer wants to be just another subcontractor, a position in which Airbus Industry tried to keep it during the initial negotiations. And that was the main reason that the Italian company did not join the consortium.

Aeritalia then embarked on cooperations in all directions. Not without success. For the fourth year in a row, the company made a profit and its sales increased by 20 percent (Fr 7 billion). A sign of prosperity: 1 month ago, 17 percent of the stock of this state-owned company were offered on the market, and up to 35 percent might end up in private hands.

The other reason for Aeritalia's success is that it chose to cooperate at international level. "To build an aircraft on your own today does not make sense!", Renato Bonifacio forcefully asserted, and he has every intention to continue in this way. This is what gave Aeritalia its rigor, as it takes the best from each partner. In the field of civil aircraft, it acquired its first experience with the Americans of McDonnell Douglas. Over 1,300 DC9 fuselages were produced. This time, it is the MD80 program that mobilizes a large proportion of the Neapolitan workers. Ten panel assemblies for the fuselage of this intermediate-range aircraft are built every month.

From this successful first experience, Aeritalia acquired knowhow in mass production. This gave it an incentive to acquire a 15-percent interest in the Boeing 767 program, placing it on a par with the Japanese. The Naples factory is thus producing three sets of moving sections and fins. But this is a program whose commercial success does not quite measure up to Aeritalia's expectations.

On the other hand, the Italian company is placing great hopes in the ATR42 program, in which it is on a par with Aerospatiale. "We were stunned to see how fast the French launched their program," Amedeo Caporaletti, manager of the transport aircraft division, acknowledged, "but this is what enabled the aircraft to reach the market in time." This rapidity also gave Aerospatiale the opportunity to take on a little more work than expected. The balance was then restored and cooperation is now quarrelfree.

Avionics and Space Activities Have the Wind in their Sails

If Aeritalia contributed much to all aspects of the program having to do with the organization of mass production, it learned project management from the French company. "In this field, it will take us 10 years to catch up with Aerospatiale," Amedeo Caporaletti predicts, and he also counts on the "propfan" propeller turbojet engine to outstrip its French partner. This talk should not be taken lightly considering that, in the field of combat aircraft, Aeritalia is already prime contractor for an ambitious tactical support aircraft project, the AMX. Aeritalia has a 46.7-percent share in this program, in which it cooperates with its compatriot Aermacchi and the Brazilian Embraer, and it has invested a lot to ensure the success of the aircraft. Thus, close to Fr 5 billion were invested in research, development and industrialization. Having already received 270 orders from the two manufacturing countries, the Turin division is expecting orders for a total of 500 to 600 units.

But the finest achievement of the division remains the Tornado. The company manufactures the swiveling wings of the 800 fighter-bombers ordered by the 3 partner countries, and it is responsible for the final assembly of the Italian models. Since only 16 remain to be delivered, the Caselle factory was relieved to learn that the Saudi contract for 72 Tornado had been signed. It also hopes to sell another 40 to Turkey, most of which would be assembled in Italy. These recent successes have also strenghtened Aeritalia in its decision to continue its cooperation with the Panavia consortium, to build the future European fighter aircraft. Besides, the division is already producing the carbon fiber wings of British Aerospace's EAP demonstration unit.

All these commercial successes are due to Aeritalia's technological experience, as the company has made a considerable research and development effort. Fifteen percent of its sales are devoted to these activities, which provide jobs for 1,500. They have enabled the company to develop its avionics and space activities, two essential branches for any aeronautical group which wants to stay in the race. Thus, the avionics division is in a position to provide fully digitized cockpits for military aircraft. Similarly, the competence of the space division, which was created two years ago, is

acknowledged by all. The 25-percent progression of its sales is there to prove it.

However, the fate of certain projects which are overly dependent on the NASA--Iris propulsion unit, Tethered and Lageos satellites--will depend on the uncertainties and the ups and downs that affect the launching of the U.S. shuttles.

[Box p 46]

From Light Aircraft to Satellites: Aeritalia's Specialties

Aeritalia, created by the 1969 merger of Fiat Aviazione and Aerfer, is controlled by Finmeccanica, the mechanical branch of the Italian group IRI. It employs 14,500 people and possesses 6 main divisions which achieved sales of Fr 6 billion, 60 percent of which on export markets, in the military (65 percent), civil (23 percent) and space (12 percent) sectors.

Fighter Aircraft Division

In Turin, 4,200 people and 3 factories. The largest division of the company is working on three aeronautical program and one aeronautical project:

- Improvement of the F104 weapon system;

- Construction of the AMX tactical support fighter in collaboration with Aermacchi (23.6 percent) and the Brazilian Embraer (29.7 percent). Italy has ordered 187 units and Brazil 87;

- Production of the Tornado wings and final assembly of the 100 Italian units as a partner in the Panavia consortium (Aeritalia 15 percent; MBB and British Aerospace 42.5 percent);

- Participation of 21 percent in the EFA European fighter aircraft project.

Transport Aircraft Division

It employs 5,850 people at 4 locations (3 around Naples and 1 on the Adriatic, at Foggia, which is entirely devoted to composite elements). This division cooperates in three international programs and is completing another national program.

- Cooperation with Aerospatiale on the ATR42, in equal proportions. Aeritalia is manufacturing the fuselages and the fins and will be responsible for the final assembly of the military version. Already, 115 ATR have been ordered;

- Shared-risk participation of 15 percent in the Boeing 767 program. The division is responsible for the whole Z-plane and for the mobile parts of the wings. Orders for 173 B767 have been received;

- Construction of the fuselage skin panels for McDonnel Douglas's MD80 and for the DC10 and KC10. Orders for 450 "series 80" aircraft have been received;

- Construction of the G222 twin-engine military transport aircraft, 106 units of which have been ordered.

Space Systems Division

In Turin, 500 people. They participate in all major European space programs: Spacelab (pressurized module), Columbus, Eureca, Ariane (tanks and liquid-fuel drive shrouds), and in the construction of many satellites (Telecom 1, Hippercos, ECS, etc.).

Avionics Division

In Milan and Turin, 1,250 people producing the avionics required for the company's military aircraft. The other major activity of the division covers instrumentation and optronics.

General Aviation Group

In Naples, 280 people. The division was issued from the Partenavia company. It produces light twin-engine aircraft, the P68 and the AP300 Spartacus.

Overhaul and Conversion Division

In Naples, Turin and Venice, 750 people. The division maintains and overhauls military aircraft and airlines.

Missile Division

In Milan, 500 people. Issued from the acquisition of Meteor, this division is developing Mirach guided reconnaissance missiles.

Alfa Romeo Avio

In Naples, 1,100 people. Aeritalia's latest acquisition, this division collaborates to major engine programs, in particular with Snecma (Atar, CFM 56) and Turbomeca (ARTM 405).

9294
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BRIEFS

SWEDEN'S ESA PART MINOR--Sweden risks being outdistanced in the area of space research. This view is presented in motions from nonsocialist as well as Social Democratic quarters in parliament. Sweden joined the European space cooperation (ESA) in 1975. In its bill, the government proposes that Sweden invest a total of 966 million kronor in ESA during the coming 4-year period. "Too little," several proposers of motions now claim. That sum will involve a reduction in Sweden's contribution to ESA by approximately 2 percent. [Text] [Stockholm DAGENS NYHETER in Swedish 5 Apr 86 p 8] 7262

CSO: 3698/0442

FRENCH ORGANIZATIONS PROMOTE BIOTECH AWARENESS

Paris BIOFUTUR in French Feb 86 pp 60-61

[Article: "ADEBIO: The Status Sheet"]

[Text] Analysis of the difficulties or rather the obstacles facing the development of the French bioindustry led ADEBIO (Footnote 1) (Association for the Development of Bioindustry) to make communications between diverse sectors of biotechnology a priority among initiatives outlined during a speech by Mr Gerard Nomine, chairman of the association, at the 26 September 1985 General Assembly. (Footnote 2) (At present Mr Pierre Monsan, scientific director of BioEurope, is president of the association. Mr Gerard Nomine remains president of ORGANIBIO.)

Regionalization

Regional communication networks already exist. Perhaps because the participants feel they have more in common, small and medium-sized businesses and industries are more comfortable with these organizations than they are with large national bodies. Therefore, ADEBIO thought it necessary to create regional branches with the cooperation of local organizations with the same concerns. The actual opening of the Lorraine branch will reportedly be followed by openings in the regions of Provence-Cote d'Azur, Alsace, Aquitaine, Brittany, and Pays de Loire, to cite only areas where a significant operation has been initiated.

How will these regional branches help communications between those involved in biotechnology? Each region will adapt its action to its own strong points and problems. All will then benefit from the positive and even the negative experiences of the others. Thus, the success of certain "biotechnology forums," where manufacturers, researchers, or financiers of the region come to exhibit or observe what is being offered in this field, could encourage the quality of similar forums elsewhere.

Communication With Bioindustrialists

To bring industrialists involved in biotechnology together without isolating them from their fields of activity, ADEBIO and the major trade unions involved

created ORGANIBIO: the National Interprofessional Organization of Bioindustries. (Footnote 3) (ORGANIBIO's statutes were field in November 1984 and published in the JOURNAL OFFICIEL of 14 December 1984.) Thanks to ORGANIBIO the bioindustrial profession has become an established reality. Bioindustrialists meet, deliberate, and act according to their common interests.

Among the tasks already accomplished ORGANIBIO's active role in the publication this summer of the Ninth Plan Commission's report on biotechnology applications in the chemical industry must be cited. Among the tasks in progress, study commissions have been created on:

--Prices of agricultural raw materials for bioindustries;

--Safety and regulations in bioindustries;

--Training of industrial biotechnologists.

Communication With Researchers

Having thus provided the elements needed to resolve communications problems on the industrial side, [ADEBIO] still had to consider public research. Biotechnology results from cooperation among several different scientific disciplines: microbiology, enzymology, molecular and cell biology, organic chemistry, etc. Several large public research organizations are involved: CNRS [National Center for Scientific Research], INRA [National Institute for Agronomic Research], INSERM [National Institute for Health and Medical Research], CEA [Atomic Energy Commission], and the Pasteur Institute. How can communication with all these research bodies be improved?

To begin with, ADEBIO contacted CNRS, INSERM, and INRA. The reception was excellent. The first results from CNRS have already appeared. In fact, its department for Research Implementation decided to create a CRIN (Committee for the Relations with Industrialists) consortium for biotechnology and entrusted Gerard Nomine, managing director of ADEBIO, with its chairmanship. This permitted the organization of a large seminar on 9 Mary 1985 where bioindustrialists were able to acquaint themselves with CNRS research themes of interest to their industrial sectors and were also able to pinpoint research axes deserving support to meet industrial needs. This positive experience with CNRS has encouraged ADEBIO to join INSERM and INRA in examining the possible problems in relations between industry and research.

Communication Within the EEC

ADEBIO receives a certain amount of important European information through its membership in the European Bioengineering Federation and disseminates everything that it considers to be useful for its members. The creation of ORGANIBIO has been approved, and similar organizations are likely to be set up in the EEC. It might then be possible to federate them into a "European ORGANIBIO." In the same vein, ADEBIO has begun to establish relations with similar associations abroad, notably in Britain, Japan, and the United States.

Logistical Help

The most important is the ADEBIO directory, a compilation of companies and governmental bodies working in the field of biotechnology. (Footnote 4) (The directory is available from BIOFUTUR.) The 1985 edition has been in great demand, and a considerably enlarged edition is planned for 1987.

Finally, the association makes every effort to respond to all those who ask for advice about education, job research, knowledge of the industrial structure, etc. That is why ADEBIO participates, at AFNOR's [French Association for Standardization] request, in the "biotechnological terminology" commission. ADEBIO was also asked to conduct ANVAR's [National Agency for the Implementation of Research] round table conference at BioExpo 85 on 7 June 1985. Several important issues concerning the mobility of researchers and patent problems were discussed. This type of meeting will undoubtedly contribute to the resolution of problems.

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CSO: 3698/A088

NATIONAL ACTION PLAN FOR BIOTECHNOLOGY ESTABLISHED IN NORWAY

Oslo AFTENPOSTEN in Norwegian 3 Apr 86 p 61

[Article by Sylvi Leander: "Now or Never for Norwegian Biotechnology"]

[Excerpts] The opening salvo has been fired. Implementation of the national action plan for biotechnology began January the first. This research field has been designated by the government as one of five principal areas to receive priority in the coming years. The four research councils together have primary responsibility for the plan. A special committee has been charged with the task of transforming words into practical action. All told, the research councils intend to invest 98 million kroner of their own money during the upcoming 3-year period. If the action plan is to be carried out, the authorities must contribute an additional 123 million kroner. It remains to be seen whether these figures will just be tidy sums on a piece of paper. It is hoped that the government will take a stand on the action plan as soon as possible.

Four areas of endeavor are singled out as most important in the plan: genetic engineering, human and veterinary medicine, plant and animal breeding, technical and industrial biotechnology.

Giant Salmon

Even though Norway lags behind in many areas of biotechnology, interesting work is being done here, particularly in the breeding of fish. With the help of recombinant DNA technology, attempts are being made in Bergen and Trondheim to clone growth hormones in salmon. The gene which manufactures growth hormone can be cloned in the salmon itself or can be placed in a bacterium which "churns out" the desired hormone. Afterwards, a certain amount of the growth hormone is mixed in with the fish fodder. Whereas previously it took the salmon many years to grow into a large and valuable fish, now it will take far less time for the salmon to attain the same vital measurements--the researchers hope.

What is possible with salmon is also possible with other animals. Bigger, stronger, and healthier are key adjectives in the national action plan for biotechnology. There is also a high degree of application in agriculture. And here the goal is, of course, the same: the biggest possible profit in the shortest possible time.

To have bacteria, fungi, yeast, algae, or animal and plant cells tailor-made for special purposes is a procedure in which industry, too, little by little sees possibilities. Experts assume that the value of products made by biotechnology will be 400 billion kroner on a global basis in the year 2000. That sum is expected to be distributed as follows: energy production 25 percent, foodstuffs 20 percent, health products 15 percent, chemicals 20 percent, agriculture 15 percent, others 5 percent.

Oil as Food

In which areas is it conceivable that Norwegian industry can profit from biotechnology?

One of the areas which may be interesting is the manufacture of fodder, believes [Professor Viggo] Mohr. Oil and gas from the North Sea could be used in the production of unicellular proteins. The latter would be good fodder, especially for the fish we breed. With the oil prices we have had up until now, it has not been feasible to use oil as food for bacteria. But who knows how low the price of oil will sink? Today most large oil companies have schemes for the production of unicellular proteins lying around in their desk drawers. Maybe the time is ripe to take a closer look at those schemes. If nothing else, perhaps North Sea gas could be put to use here. It, too, can be used as food for bacteria.

Mining is another catchword. Maybe old mounds of ore can be made into something valuable again with the help of bacteria which extract metals from the ore.

Another interesting sector where biotechnological methods can be applied is the chemical industry. Many of the synthetic chemicals which are used today can be replaced by biochemical substances which serve the same purpose. And maybe it will be less hazardous to people and their surroundings to use substances which nature itself has manufactured rather than today's synthetic products. With respect to plant protection, too, it is possible that biochemical substances can successfully replace synthetic sprays, Mohr points out.

Not Afraid

There is considerable fear--particularly in religious circles--that biotechnological research may lead mankind down dangerous paths. The fact that today we have methods which make it theoretically possible to "throw together" a human being with special genetic characteristics sends shivers up and down the spine of some people. Intervention in the "creation process" itself may have ethical consequences the scope of which we cannot envision today, claim the skeptics, who want a law to regulate technological research.

Still others fear that experiments with microorganisms could generate monsters the researchers might lose control over, "creatures" which we are unable to render harmless and which can cause undreamt-of damage.

"Is this fear totally unfounded?"

"The likelihood of producing monsterlike bacteria is infinitesimally small. But there is, of course, a risk that we must be aware of. We have also assessed this

danger in our work with the national action plan. Here it is suggested that we make an evaluation--one that ought to have a reassuring effect--of biotechnology from an ethical viewpoint and in terms of safety."

A Special Law?

"But what about a special law that tells researchers what they are allowed to do and what they must avoid?"

"I myself can't see any purpose to such a law. The research sphere in Norway is so small and surveyable that it would scarcely go unnoticed if someone started doing wild experiments. Through the four research councils, we will have a good idea of what is happening, because the councils control the purse strings. The committee the councils have appointed will evaluate the individual project proposals that come in. The committee then has a good opportunity to see to it that the research is conducted in supervised and dignified forms," emphasizes Mohr. Based on his knowledge of the moral standards of Norwegian researchers, he does not fear any backsliding from what society would accept as wholesome research.

Now or Never

Naturally, a small country like Norway cannot be at the top of the entire spectrum which biotechnology covers. What is important is that we develop experts who can benefit from research results achieved in other countries. We must learn and master techniques so that we can use them in a Norwegian context for projects which interest us. We must find a niche where we ourselves can be world leaders, where we ourselves can "make" money. Mohr sees such a niche in the steadily growing area of aquiculture.

At the same time we must be prepared for the fact that there are areas--for example, agriculture--where we have to do some independent research. It will be important, for our part, to find the plant varieties which best adapt themselves to the Norwegian climate. This is research no other country will do for us, Mohr points out.

"In order to be technologically advanced, we are compelled to make maximum investments in research and education. We must be prepared to buy a good deal of the technology and knowledge abroad, and that is why we have to be in a position to distinguish between good and bad merchandise. When we go shopping, we must not stand around with our hat in our hands--on the contrary, we must know what we want and how much we're willing to pay for it.

"In view of the startling developments that have occurred in biotechnology in recent years, the time has now come for us to decide whether or not we want to ride on the merry-go-round. As a research nation, Norway is in the minor leagues today and in danger of being demoted even further. We are gambling with the nation's future," fears Mohr.

12327
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ALFA LAVAL, PHARMACIA TO SET UP, SELL COMPLETE FACTORIES

Stockholm NY TEKNIK in Swedish 10 Apr 86 p 3

[Article by Birgit Andersson]

[Text] Alfa Laval and Pharmacia will be joining forces in a new biotechnology enterprise. The enterprise, which will be located in Uppsala, will be the only one in the world to sell complete biotechnology factories.

Pharmacia is today the leading enterprise in the world in purification, the separation of biotechnological products on a laboratory scale.

Alfa Laval is in a position to manufacture equipment for separation and has a long experience in purification in large quantities.

In the new enterprise, Pharmacia will be in charge of the basic processes and Alfa Laval of the construction of entire plants.

What Pharmacia does on the small scale, Alfa Laval will convert to the factory scale.

From Grams to Kilos

Fine purification of products produced by way of biotechnology is today one of the most important tasks within the field of biotechnology, but it is also by far one of the most difficult tasks. It is here a question of separation of things such as proteins, nucleotides and hormones; a separation on the molecular level.

Production on a larger scale than in the laboratory is a future must. Otherwise, production by way of biotechnology will never become economically feasible.

The question of production on a larger scale, therefore, is a hot topic within the field of biotechnology. "What we shall now see is a production development from grams to kilos," says John Curling, division chief of Pharmacia's department for process separation.

Building Factories

NY TID has previously described the basic process used by Pharmacia for purification. It is based on a chromotography system and special filtering media. The system is used by large biotechnology enterprises, such as Genentech in the United States.

Alfa Laval has factories throughout the world. Factories for production of fermentation vessels, homogenizers, measuring equipment and process automation; large-scale machinery which future biotechnology factories will have to have.

Five Hundred Million

The new enterprise is expected to have a turnover of about 500 million kronor within a 24-month-period, and the enterprise is expected to have a personnel of 200 people, largely acquired by way of transfers within the enterprise.

Pharmacia will be the owner for 45 percent and Alfa Laval for 55 percent.

A preliminary agreements exists today, and the enterprise will start operation in June.

7262
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EUROPEAN CONSORTIUM TO DESIGN GENE TOOL KIT FOR FOUR CROPS

Frankfurt/Main FINANCIAL TIMES in English 15 May 86 p 24

[Article by David Fishlock]

[Text]

A CONSORTIUM of 15 academic and industrial organisations has just launched an ambitious pre-competitive research programme which could dramatically affect the price and quality of our food in the mid-1990s. Over the next three years they hope to design a plant gene "tool-kit" and user's manual, permitting the user to make radical changes in the genetic make-up of some of Europe's more valuable crops.

The initiative itself is British, mounted by the Laboratory of the Government Chemist in London, where Dr Ron Coleman, as Government Chemist, doubles as the Government's chief adviser on biotechnology.

The 11 companies include such multinationals as Royal Dutch-Shell, Unilever and Ciba-Geigy. Four of them are minuscule biotechnology start-ups, some US-owned. The four academic institutions are the Plant Breeding Institute and the John Innes Institute, both of the Agricultural and Food Research Council, and the universities of Durham and Warwick.

It has taken Dr Keith Cowey a year to forge this union of very disparate interests, since he was seconded by British Petroleum to the "think-tank" of advisers who counsel Ron Coleman on biotechnology. Among his problems have been reconciling the commercial interests of very different kinds of company, and picking the academic teams most likely to succeed.

Companies pay the same, regardless of size; about £50,000 a year. The Government doubles the money, providing a total of £3m for the three-year programme. Still more to the point, the companies have harnessed the expertise of about 40 British academics—perhaps 70 per cent of the national expertise in this area of plant science.

The research will be done in the four academic institutions, overseen by a programme manager now being recruited for the task. When he arrives he will find most of the cash has already been allocated to the three projects agreed by the consortium, except for £300,000 retained for contingencies. "We can't hope to get it all right now," acknowledges Dr Cowey.

If the programme eventually succeeds it will have established "enabling technology" to allow any user of the plant gene tool-kit to make gene transfers within crop plants a routine procedure. The 11 companies will then be free to exploit this enabling technology in any way they wish—perhaps to grow peas more resistant to weather or pests in the case of a big food company, or to develop into a specific technique which can be licensed to third parties in the case of a start-up.

The programme focuses on four crops of particular interest in Europe: wheat, barley, peas and oil seed rape. Other crops were rejected as being of less importance, even though—in

the case of potatoes by the Rothamsted Experimental Station — techniques were already partly worked out.

The first and biggest of the three projects aims to establish transformation and regeneration systems for all four chosen crops. "We're trying to turn the art of tissue culture into a science," says Dr Cowey. Dr Richard Flavel at the Plant Breeding Institute is leading this project, although Professor Don Bolter at Durham has made good progress with rape, and the John Innes Institute with peas.

Success for this project will come if the three steps of handling plant tissues, delivering DNA into its cells efficiently, and selecting the desired improvement in properties can all be accomplished on a routine basis for all four crops.

The second project concerns genetic engineering. It aims to isolate the gene of interest—one that controls the storage of energy or the process of photosynthesis, for example—and test such plant genes to ensure that the isolated and reconstructed genes can be expressed (replicated) by biotechnology methods.

The idea is to use the "gene cassettes" produced by this project to transform the four crops, using the technology developed in project 1. It will focus particularly on the genetic engineering of seeds, because it is seeds or grains which are normally harvested. But it may turn out that in order to modify plant growth the new gene products have to be localised in specific parts of the plant's cell, such as the chloroplasts, where photosynthesis takes place.

As in the case of project 1, project 2 involves the Plant Breeding Institute, the John Innes Institute, and Durham University.

Warwick University researchers led by Professor John Ellis are the prime movers in project 3, which relates closely to project 2 but aims to put the genes more precisely into a part of a plant cell responsible for a particular function. Warwick University and the John Innes Institute have already had some success with peas and believe their techniques are not species specific. If this proves the case, it could afford an efficient way of by-passing the overall control of a plant cell in making desired genetic modifications.

The three projects are therefore closely inter-related. Dr Cowey categorises it as "basic applied research," suggesting a significant risk that it will fail.

But the academics, in joining the consortium, have waived no rights to publish their research. They have agreed only to submit publishing plans and patent applications first to a consortium committee to ensure the protection of group rights.

The consortium provides a "critical mass" of effort focused on to the problem which no one organisation seemed willing to assemble itself.

But the very fact that such a programme has begun indicates success on one count: the agri-food industry has been persuaded to take a long-term view of its needs.

Dr Cowey also believes that the fact that 11 companies will all have their own ideas for exploiting the genetic tool-kit, should it materialise, will prove a great encouragement to fast technology transfer.

/9317
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SAAB-BOEING JOINT VENTURE TO DEVELOP 7J7

Stockholm SVENSKA DAGBLADET in Swedish 26 Mar 86 section 3, p 1

[Article by Bo Ostlund]

[Text] Under the terms of a cooperation agreement signed on Tuesday by Saab-Scania and Boeing, the U.S. aircraft manufacturer, Boeing will buy engineering know-how--and later production capacity as well--from Saab for development of Boeing's new 7J7 airliner.

Saab-Scania's share of the joint project amounts to between 2 and 4 percent, but that did not prevent Harald Schroder, managing director of Saab's Aircraft Division, from regarding the agreement as an honor:

"Being chosen to join the world's largest civilian aircraft manufacturer in coming up with an entirely new aircraft means a stamp of quality for Saab--an honor," said Schroder.

With him in Stockholm on Tuesday was Richard Albrecht, vice president of the Boeing Commercial Airplane Company, who told SVENSKA DAGBLADET:

"What we want from Saab is its technical know-how. We were already acquainted with Saab, and the firm is highly regarded internationally."

Previous Cooperation

The acquaintance between Saab and Boeing dates from the years just after the hassle over the B3LA--the Swedish combat plane that never came into being. At the time, Saab's Aircraft Division had excess technical capacity and offered it to Boeing, which happened to need engineers just then.

That cooperation boosted Saab's reputation in the United States, and Albrecht said he had strong confidence in Swedish aeronautical know-how.

The new agreement gives Saab-Scania the chance to join in developing the next generation of airliners--the fuel-efficient turbofan plane of the 1990's. It therefore marks a return to propeller drive: a fuel-efficient jet engine with two "fans" facing the rear of the plane and rotating in opposite directions.

New Material

"Ultra High Bypass" is the name of the concept which even McDonnell Douglas, a competitor, is working with--and Saab is in on that, too.

Boeing's 7J7 project will use a new, lighter material and also take advantage of new fuel-saving aerodynamics.

Saab's role in the project to start with will be to export engineers to Boeing in Seattle. The production of "body components" in Linkoping, Sweden will come later.

Schroder says: "We will be concerned mainly with tails and wings."

That suits Saab perfectly. Its experience with military production and the SF-340 will now be further improved.

Depending on how successful Boeing is with its sales, the project may result in from 300 to 360 new jobs in Linkoping.

"Saab is also taking a risk," says Albrecht. "If the project gets off to a slow start and Saab's costs rise at the same time, it will not be a good deal."

And vice versa. If the 7J7 is as successful as Boeing expects it to be, Saab will participate by producing in truly high volumes. Every airline company in the world has expressed an interest in the new turbofan airplanes: what the 7J7 means to them is a 45-percent savings in fuel consumption.

Richard Albrecht says that the 7J7 will be in commercial operation by 1992 and that test flights will therefore take place in 1991--the same year in which McDonnell Douglas, the competitor 900 miles to the south in Los Angeles, will be flying its first Ultra High Bypass.

SAS a Customer?

Boeing's method of developing the 7J7 also says something about its sales philosophy: thanks to a long succession of joint venture agreements spanning the world--making Saab-Scania, with its 2 to 4 percent, only one in a series of Japanese, British, Australian, and other manufacturers--Boeing is putting itself in close proximity to the local markets in which the airline companies operate.

And Jan Carlzon, head of the SAS [Scandinavian Airline System] group, who visited Seattle last week, has already said that he hopes SAS will become a Boeing customer and buy the 7J7.

"This is Boeing's first big international joint venture," says Albrecht. "The aviation industry is becoming increasingly international. We want to take advantage of the best engineering know-how available anywhere."

It is also true that even big firms like to share the risks--and astronomical sums are involved when a new commercial aircraft is being produced.

The price tag on Saab's share of the agreement with Boeing is not yet clear--in the present situation, Schroder's signature on the agreement involves only a commitment to participate and share the risks.

11798
CSO: 3698/423

EUROSOFT IMPROVING QUALITY OF FRENCH SOFTWARE

Paris ZERO UN INFORMATIQUE in French 10 Feb 86 p 58

[Article: "Quality Control of Software and Technology Transfer"; first paragraph is ZERO UN INFORMATIQUE introduction]

[Text] A few months ago Logiqual, a company specializing in software guarantees and quality control, was founded in Toulouse on the initiative of the Eurosoft group.

Four data processing companies, SESA [Automation Systems Research Company], STERIA [R&D Company for Data Processing and Automation], SYSECA, and Informatique Internationale, as well as the Banque Courtois and various individuals, hold shares in Logiqual amounting to Fr 1 million.

In view of the goals set for the company, the National Center for Space Studies [CNES] in Toulouse supported its establishment.

Logiqual will certainly work for clients in the space sector, but in other industrial sectors as well: aeronautics, telecommunications, transportation, etc.

It is from this perspective that CNES thinks technology transfer from the space sector to other activities can be achieved thanks to Logiqual. Therefore, CNES is ready to support its activity, especially through research and development projects.

Hermes, VAL...Big Markets on the Horizon

With the CNES as a customer, Logiqual enjoys an important asset. Spin-offs of the Hermes program involving software quality control should provide Logiqual with a sufficiently full agenda to ensure pleasant future prospects.

Jean Auricoste, who is the president and general manager of both Logiqual and Eurosoft, foresees rather significant company development. Staffing should increase from 15 engineers in 1985 to 50 or 60 engineers 4 or 5 years from now, and turnover, estimated at Fr 10 million from now till the end of 1986, should be multiplied by 10 over the next 5 or 6 years.

This progress takes only the space sector into account, but the company intends to position itself in other industrial sectors and is especially targeting the market that VAL, the future automatic subway planned for Toulouse at the beginning of the next decade, could represent.

Furthermore, the company wants to diversify its activities. Elie Dorio, general manager of Logiqual, who was previously responsible for the data processing engineering division of the Toulouse Space Center, does not conceal that "although the company's business is initially focused on data processing engineering, software guarantees, and quality control, it should quickly extend into training and consulting."

25025/12781
CSO: 3698/A082

GERMAN PARALLEL COMPUTER TX2 READIED FOR MARKET 1987

Frankfurt/Main FRANKFURTER ALLGEMEINE/BLICK DURCH DIE WIRTSCHAFT in German 25 Mar 86 p 5

[Text] Hamburg--IP Systems in Karlsruhe plans to bring its first high-performance computer on the market at the beginning of 1987. This youngest of German computer manufacturers is advertising a computer, the TX2, which supposedly works up to a thousand times faster than current large-scale computers. It is being said that the company wants to venture into the realm of supercomputers by Cray, Control Data and IBM. Nevertheless, the company currently has only seven employees working on systems development. Thus, standard components by international suppliers will supposedly be used for production. The actual manufacture of computers will reportedly be entrusted to contracting partners. Development is being financed for the most part by "venture capital" and by assistance from the national ministry for research and technology. The company, founded in 1985, wants research and development institutions as its first customers. Thought is also reportedly being given to commercial applications at a later point, because there is a sharply growing need for extremely high computer performance here as well.

To a certain extent, the new computer company is a "spinoff" from the University of Karlsruhe, which carried out research in this area and thus also laid the foundation for the technology of the TX2 computer design. The scientists developed a plan for a parallel computer for which the system architecture consists of a tree structure. The branch points are occupied by processors, each with equal functional ranges. Each processor is assigned its own memory. It is reported that the architecture makes it possible to carry out any number of computing functions on a parallel basis. In application, the processors could be interconnected flexibly so as to divide heavy loads or to run several jobs simultaneously. "Bottlenecks" are supposedly avoided in the interplay of the processors and in connection with data input and output. According to this plan, the processors are connected to one another by direct channels instead of by bus circuits. During the CEBIT show in Hannover, data sets of between 10 and 30 million instructions per second were called. The

company wants to first produce computers in the DM 80,000 to DM 15 million price range; these machines can be used in satellite systems in connection with main computers or as a central system. A specially adapted operating system has been developed in accordance with the system architecture.

12271
CSO: 3698/422

UK'S INMOS LAUNCHES 'ITEM 400' WITH 400 MIPS CAPACITY

Frankfurt/Main FINANCIAL TIMES in English 15 May 86 p 8

[Article by Alan Cane]

[Text]

INMOS, the Thorn-EMI semiconductor manufacturing subsidiary, yesterday launched a raft of new products including a computer system eight times more powerful than the biggest commercial mainframe computer available from IBM, at a fraction of the cost.

The new machine, the Item 400, is said to process 400m instructions a second (mips). IBM's biggest machine, the 3090 Model 400, which consists of four processors connected together, is rated at 50m instructions a second.

At a list price of £40,000 for the Item 400, Inmos claims that each mips costs the user only £100. The IBM machine costs over £100,000 for each mips.

The comparison is not quite fair because the IBM machine is designed to process commercial workloads. The Inmos supercomputer, containing 40 of its revolutionary "transputer" microprocessor chips, is designed for research in parallel processing, a technique for persuading many microprocessor chips to process a workload co-operatively.

Many people believe that the future of commercial and scientific computing lies in parallel processing.

The products launched by Inmos include a new transputer which processes information 16 bits at a time, several evaluation systems and computer system control devices.

/9317
CSO: 3698/459

SECOND GENERATION NC-MACHINES BOON FOR SWEDISH COMPANIES

Stockholm DAGENS NYHETER in Swedish 29 Mar 86 [page numbers not given]

[Article by Osmo Vatanen]

[Text] A decade ago, Strand's mechanical workshop at Rosenfors in Småland was faced with a choice--either to go out of business or to replace people by machinery.

The fully automatic, numerically controlled machinery made its entry into the factory. It rescued the factory and provided scope for new jobs and new products.

The Swedish engineering industry is largely faced with the same choice as Strand's. They have actually got no real choice. The number of NC-machines has thus increased from 1,600 to upwards of 6,000 in a decade, and robots and advanced computer technology will soon make their entry.

Time seems to stand still in Strand's low, yellow-colored factory building on Lillesjovagen in Rosenfors, where they have been manufacturing vertical drilling machines since 1937.

In the grey and green factory halls are milling machines, lathes and drilling machines, which former generations of workers in the firm had no difficulty handling. They still serve a purpose but have got no real roles to play next to the three automatic lathes and the three multioperation machines which have taken over large sections of the heavy work.

Forty Tools

It applies to all of them that they perform all machining processes without the operator having to intervene except to exchange work pieces (raw materials) when it is time to do so and to reprogram the factory orders of the machine in the computer-controlled control box if the routines have to be altered.

The largest one of the NC-machines (numerically controlled machines) is equipped with 40 tools, mounted on a gigantic rotary disc. Holger Raatikainen,

operator, feeds the machine with the raw material for the gear casings of vertical drilling machines. The machine reverses and rotates and, subsequently, itself replaces the palette by the gear casing, drills holes, mills exteriors even and exchanges clicking and rattling tools on the disc between revolutions. It replaces at least three machine tools and even provides scope for other work beyond supervision of the machine.

Lennart Thorsson, foreman, points to an NC-lathe close to him:

"We can hardly produce 20 percent of what it is capable of producing."

Manual Jobs

The time it takes to produce a gear casing in the machines has declined from weeks to about 40 minutes, and the throughput time from raw material to finished products has also dropped drastically.

A number of jobs are still performed manually. Raatikainen threads handles for vertical drilling machines and drills the small holes in the gear casings by hand when there is time left for it.

"The big machine is not sensitive enough for the drilling of small holes," Thorsson says.

If it becomes necessary to take out or redo individual pieces, this is also often done by hand.

"It becomes too complicated to reprogram the NC-machines for this," Thorsson says.

Twenty Men Replaced

At the same time, jobs have become more monotonous and more routine. Manual jobs and reprogramming constitute the main job variations that are offered.

To the firm, however, the NC-machines have meant the difference between survival and close-down.

"Without these machines, our production would have become too expensive," says Sivert Steen, owner.

"They probably replace about 20 men. That is the main saving. But it has not been necessary either to expand the workshop and we shall be able to cut our storage costs considerably since the throughput period has dropped drastically," Steen states.

The NC-machines were installed when the demand increased drastically during the years immediately following the big oil crisis in 1974-75. The rate of production increased rapidly from about 2,000 to 3,500 units per month. The order books are now filled and the delivery time is 4 months. The exports go to 28 countries, mainly to the United States.

"I am not afraid of the competition from developing countries," Steen says.

"A firm in Taiwan made an exact copy of our machinery but was unable to do us any harm. The production of the countries in the East does not come up to our quality levels either."

The chief competitors are instead the Arboga and Solberga engineering firms.

Own Prototype

The future for Strand's lies in the workshops located a few hundred yards farther away. It will not be possible to increase sales of vertical drilling machines.

In those workshops stands the prototype of the first multioperation machine produced by the firm itself as well as elements for a robot which will be tailored to the needs of Strand's customers.

Their markets are expanding rapidly, and Steen expects to recruit more personnel.

"At the end of the year, we shall have 65 employees. We have now 40 men for the vertical drilling machines and 14 for the robots," Steen says.

He should be able to automate the entire vertical drilling production right down to the assembly but does not plan to do so:

"It is not worth it, and we have made very big investments now. Everything self-financed."

Rationalization an Absolute Necessity

Strand's mechanical workshop shows that many firms need not invest in any science-fiction type of computer technology in order to hold their own in the competition. However, continuous rationalization is absolutely necessary.

NC-machines were the first large pieces of automated machinery to make their entry into the engineering industry. They started arriving in large numbers about 20 years ago. But whereas there were only approximately 1,500 NC machines in the country in 1976, the number has today increased to upwards of 6,000.

NC or NS (Numericall controlled) simply means that the operation of the machines is controlled by digital information. The digits are converted into electrical impulses which control the motions of the machines. A mini-processor is not necessarily needed for this, but electronics is today the least expensive, the most compact, the fastest and the most exact means of control.

NC-machines are now in the process of becoming integrated into the next large-scale wave of automation. It will also include robots, fully automated production with advanced data controls.

All of this new technology is arriving at an enormously fast rate. The engineering industry is subject to a very hard price pressure, not least from its biggest competitor, West Germany. This hurts the more since approximately half of the production of 230 billion kronor annually is exported, at the same time as the hold on the domestic markets has been weakened of recent years.

The engineering industry has never invested as much as in the eighties. The major part, of course, goes into rationalization. It has been most successful within the automobile and electronics sectors, which have also kept up their growth rates and had the highest recruitment rates.

It is the older branches of industry, such as the metal and machine trades that are hit the hardest, not to mention the shipyards.

7262
CSO: 3698/0453

PAN-EUROPEAN EUREKA PARTNERSHIP TAKING SHAPE

Stockholm NY TEKNIK in Swedish 20 Mar 86

[Article by Miki Agerberg: "Opens Doors For Swedish Industry"]

[Text] "Eureka has opened the doors for us to a cooperation which we have previously tried to establish without success."

These are the words of Arne Wittlov, production development chief of Volvo Flygmotor [Volvo Aircraft Engine]. He is one of the Swedish industrialists who are now prepared to jump onto the Eureka bandwagon.

Together with partners from France and Italy, Volvo Flygmotor is ready with plans for a Eureka project involving construction of a gas turbine from new materials.

The French rocket firm of SEP has developed an advanced silicon carbon composite, and now the intention is to study jointly how it can be used in gas turbines.

"Earlier we tried unsuccessfully to cooperate with SEP," says Arne Wittlov. "It is Eureka which has opened the doors for us."

The project is estimated to cost about 120 million kronor and take 5 years. If things go well, there are interesting possibilities for continued cooperation.

This is one of the new Eureka projects being prepared at the moment in which a Swedish company is involved. As yet there are not very many of them:

Greater Scepticism

"There is still a great amount of scepticism of Eureka among many Swedish company leaders," says Ulf Sviden at the Department of Industry.

"This scepticism is greater than in other countries. Many ask why they should cooperate with Europe in particular, why not just as well the United States or Japan?"

But, Ulf Sviden says, things are beginning to loosen up now:

"For Eureka's next ministerial meeting in June I think at least five Eureka projects with Swedish participation will have been launched and ready."

Right now the situation is the following:

Sweden is included in a small part of five of the Eureka projects which so far have definite or preliminary approval.

Swedish cooperation is definite in two of these.

Saab-Scania Combitec, along with half a dozen other European companies, participates in ES2, a large project which is aimed at developing the technology for making customer-adapted integrated circuits drawn directly on the silicon wafer with electron beam litography.

And the Nature Preservation Agency participates in Eurotrac, which is to increase knowledge about how air pollution is spread in Europe.

Both of these projects are likely to have been realized even without Eureka. But the Eureka stamp can facilitate contacts and financing.

The Telecommunications Agency participates in discussions about the shape of Euronet, a European computerized network for exchange of information between researchers. Its subsidiary Telelogic has been interested in cooperation around software development, and Volvo has expressed interest in a project aimed at tracing sources of noise in transportation vehicles.

A usual explanation for the wait-and-see attitude of the Swedish companies is that they want to push for state support funding. While the French state is investing a billion kronor the first year and the West German state more than 100 million, the Swedish state says no to special Eureka funds.

State Support

Arne Wittlow regards state support as a precondition for Volvo Flygmotor to be allowed to participate in the gas turbine project.

"Our foreign partners want to see a guarantee from the Swedish state so that they can be sure of a stable and long-term cooperation."

At the Industry Department Ulf Sviden opens the lid to the cash box just a tiny bit:

"There will never be a Eureka fund of French dimensions. But the forms of support which we already have (STU, the Industry Fund, the renewal funds, etc.) will be tested in a positive sense."

"We have now indicated that opportunity more clearly to the companies."

Up to now the Swedish companies have latched onto projects for which others have taken the initiative. But now a Swedish company has presented its own proposal for a Eureka project.

It is Bonnier-owned Medipharm in Angelholm which wants to develop a new generation of biological additives in animal fodder:

"We know which companies we want to cooperate with," says Mats Fischier at Medipharm. "We hope that the Eureka stamp will facilitate contacts with them."

11949
CSO: 3698/413

FRENCH GOVERNMENT MOVES TO DENATIONALIZE MATRA, DASSAULT

Paris LE MATIN in French 8 Apr 86 p 3

[Article by Eric Walther: "Matra, Dassault, but not Renault"]

[Text] The two weapon manufacturers "amicably" nationalized by the Left are scheduled to be put into private hands. As for Renault, it will have to wait until the next legislature.

The presence of Matra and Dassault on the list of companies likely to be transferred to the private sector in the next 5 years is undeniably no great surprise. First, the two companies were not directly affected by the 1982 nationalization law, as their takeover by the State--51 percent in each case--was "amicably" negotiated by the Mauroy government. We can therefore say that, with this decision, the new government is flaunting its determination to make a clean sweep of the socialist past. However, we still have to find where the logic for such a commitment lies, although including these two companies in the capacitation law does not imply that they must be transferred to the private sector during this legislature. But the tone is set.

One thing the two companies have in common is that their operations are predominantly military. In the case of Dassault, it is even its only trade, or almost (90 percent of its Fr 16 billion in sales, about three-fourths of which come from export sales). For Matra, the proportion is smaller but still very significant (70 percent of sales for the parent company, 40 percent for the group as a whole). These are therefore two companies whose relations with the State are "historically" very close. The main client being defense, nationalization did not basically alter the rules of the game. Especially considering that, in the case of Dassault, the operation was carefully sealed by Marcel Dassault himself. When he offered to the State 25 percent of the shares he owned in the company, that was a gift of some Fr 2 billion that he presumed to make to those who wanted to nationalize 100 percent of the Saint-Cloud company. This gift increased the State's participation to 45 percent of the capital, and all the new owner had to do was to acquire the 5 percent of shares owned by the public to achieve a majority interest. In exchange for this, Dassault obtained from the government "continuity" for his company; in particular, its management was to remain the same. We can now rely on Marcel Dassault to remind the "new" owners of this gift, should the company be transferred to the private sector...

For Matra, the problem is slightly different. Jean-Luc Lagardere's group is in fact engaged in a refocusing of its operations (withdrawal from automotive electronics, as we could see recently with the planned agreement of Solex and Jaeger with Fiat; soft-pedaling on microcomputers, etc.). Conversely, the group is now at the center of the card reshuffling taking place in the French private telephone industry, an activity it just took over from the CGCT group. The latter is also in a bad state and is listed among the companies that might be denationalized. As a result of its policy of diversification in all directions, which proved costly, Matra has now decided to "tighten" its strategy. It will rely essentially on its military branch, which remains its backbone.

Therefore, if the dossiers of Dassault and Matra, two strategic firms if there ever was any, should be scheduled for denationalization at an early date, Jean-Luc Lagardere and Marcel Dassault would not fail to remind the government of its commitment concerning "the conditions of temporary protection of national interests from the effective date of nationalization" which would have to be indicated in all official orders. At any rate, it is certain that the safeguards that will be implemented to preclude any foreign penetration when the company changes hands will have been previously tested on other nationalized companies. This will obviously postpone the Dassault-Matra case to a relatively distant date.

As for the Renault dossier, it will be postponed at least until the next legislature. Certainly, before the elections, the Right had been careful not to make any commitment concerning this company, and Jacques Chirac just indicated that "Renault was a candidate for denationalization," without however giving any date. The continued difficulties of this company, in particular its alarming state of indebtedness, but also the highly symbolic character of Renault as a national company, certainly weighed in Edward Baladur and his team's decision not to include it in their program. At a time when Georges Besse is cutting into the living flesh of the company, the emotional impact of an eventual denationalization of Renault might have had a devastating effect on the relatively peaceful labor relations at the group's plants.

Nationalized Financial Institutions

Institution and Chief Executive Officer	State Particip. (%)	Total Assets (*)	1984 Results (*)	Denationalization value (*)	Personnel
The 3 "Old Ones"					
BNP, Rene Thomas	100	949.5	+1.7	21.3	60,014
Societe Generale, Jacques Mayoux	100	835.8	+1.2	15	44,088
Credit Lyonnais, Jean de Flassieux	100	868	+1	13	52,000

* Billion francs

Institution and Chief Executive Officer	State Particip. (%)	Total Assets (*)	1984 Results (*)	Denationalization value (*)	Personnel
Banks Nationalized in 1982*					
CCF, Gabriel Rallex	100	160	+0.2	2.8	8,174
CIC, Georges Dumas	61	-	-	2	31,782
Credit du Nord, Bruno de Maulde	50	0.9	+0.3	0.6	11,844
Banque Hervet, Lisette Mayret	100	-	-	0.3	1,355
Sofinco, Christianne Dore	100	-	+0.4	0.3	1,498
La Henin, Dominique Saglio	100	0.28	+0.04	0.2	1,969
Two Financial Companies (1982)					
Paribas, Jean-Yves Haberer	100	539	+1.1	11.1	28,000
Suez, Jean Peyrelevade	67	263	+0.7	6.9	10,951
Insurance Companies (total premiums)					
UAP, Yvette Chassagne	88	28	+1.3	8.8	17,554
GAN, Bernard Attali	78	15.8	+0.6	4.1	8,360
AGF, Michel Albert	89	18	+0.95	5.7	14,800

* Billion francs
** A total of 39 banks became state-controlled. We are giving only a few examples.

Nationalized Industrial Groups

Industrial Group and Chief Executive Officer	State Share (%)	1984 Sales (*)	1984 Results (*)	Value (*)	Personnel
CGE, Georges Pebereau	100	74	0.8	4.6	161,900
Saint-Gobain, Jean-Louis Beffa	100	61	1.2	7	125,228
Pechiney, Bernard Pache	81.7	35	0.54	4.1	48,230
Rhone-Poulenc, Loic Le Floch Prigent	90.9	51	1.9	5.4	79,230
Thomson, Alain Gomez	100	57	0.035	2.15	112,000
Bull, Jacques Stern	98	13.5	-0.48		26,435
Marcel Dassault Aircraft, Benno Claude Vallieres	51	15.6	0.44	3.8	16,196
Matra, Jean-Luc Lagardere	51	13.7	0.068	1.6	28,000

* Billion francs.

9294/9869
CSO: 3698/424

ESPRIT PROJECT SYNPOSES PUBLISHED BY EEC

/Editorial Report/ The Information Technology and Telecommunications Task Force of the EEC in January 1986 published six booklets in English entitled ESPRIT PROJECT SYNPOSES that provide a topic-by-topic breakdown of the ESPRIT /European Strategic Programs for Research and Development in Information Technology/ initiatives currently underway. The booklets constitute a comprehensive introduction to the specific ESPRIT project goals and an identification of all the firms involved. The six booklets have the following subtitles: ADVANCED MICROELECTRONICS, SOFTWARE TECHNOLOGY, ADVANCED INFORMATION PROCESSING, OFFICE SYSTEMS, COMPUTER INTEGRATED MANUFACTURE, THE ESPRIT I.E.S.

ADVANCED MICROELECTRONICS, a 60-page publication, explains that "the major thrust of the research and development programmes within Microelectronics is to push the silicon based technologies of MOS and Bipolar towards their limits of capabilities (areas 1.1 and 1.2) whilst pursuing the possibilities afforded by the compound semiconductor materials, such as Gallium Arsenide (area 1.4), which have potential capabilities in key areas beyond those possible using silicon." Attention is also being given to the computer aided design of VLSI systems (area 1.3); optoelectronics (area 1.5); advanced display technologies (area 1.6); and more innovative technologies (area 1.7) such as packaging, device modeling, and special processing materials. A typical project description from ADVANCED MICROELECTRONICS in English p 54 reads as follows:

"Topic: 1.7.2.1 Wafer Scale Integration

"Proj. Ref. 824: B/85

"The design and demonstration of systems up to 25 million transistors system on a single chip will be performed by connecting the good cells of a wafer. Technological studies of switches will be restricted to on one hand floating gates FET and on the other hand laser fuse/antifuse in a 1.4 micron CMOS technology. Copper tracking technique will be evaluated. A study of thermal and electrical characteristics of the package and bonding will be made and used to provide a suitable package for the demonstrators.

"The demonstrator/s/ chosen are:

--a 4 Mbit static RAM using redundancy at the intracell and intercell levels.
--a 16 bits microprocessor tolerant to end of manufacturing defects.

--a systolic array for image processing which will be demonstrated also in a system with the corresponding software.

"Special interest will be given to test facilities and test strategy both at the cell and whole wafer levels.

"The methodology developed can be used to build more complex systems including on the same wafer microprocessor, memory, peripheral circuits...when 3 levels aluminium technology will be industrial.

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Inst. Nat. Polytech. Grenoble, France
Universite du Languedoc, France

SOFTWARE TECHNOLOGY, a 36-page publication, explains that "after 2 years of ESPRIT Phase 1 we now have underway...and we are now in a position to identify the areas which require strengthening and indeed adding to the workplan for Software Technology.

"The directions required for 1986 are identified in detail in the following sections, but the need for new projects to promote the rapid transfer of the results of the programme into the industrial environment is likely to be the main theme for 1986. Therefore the following themes will be given /priority/ for new work called for in call(s) for proposals published in 1986:

(i) reuse of software components
(ii) commercial security of software
(iii) demonstrators for evaluation of methods and tools in the industrial environment"

ADVANCED INFORMATION PROCESSING, a 45-page publication, explains that "the following themes will be given priority for new work called for in call(s) for proposals published in 1986:

(i) demonstrators (see section 3.1.3)
(ii) multi-sensor systems (see section 3.2.3)
(iii) integration of numeric and symbolic processing (see section 3.4.3)

OFFICE SYSTEMS, a 55-page publication, explains in its introduction that office systems research has been divided into five areas:

--Office systems science and human factors (4.1)
--Advanced workstations and human-machine interfaces (4.2)
--Communications systems (4.3)
--Advanced multi-media storage and retrieval systems (4.4)
--Integrated office information systems (4.5)

COMPUTER INTEGRATED MANUFACTURE, 37-page publication, addresses "the desirability of developing a reference model, which would allow users to develop multi-vendor CIM systems....This is an area where the potential for significant advances through a unified approach are high, and it is therefore particularly suitable for effort on a Community scale." The first project description from COMPUTER INTEGRATED MANUFACTURE in English p 3 reads as follows:

"Topic: 5.1.1.1

'AMICE, A European Computer Integrated Manufacturing Architecture'

"Proj. Ref. 688: B/84

"It is intended to define and develop Open Systems Architectures for CIM, to support present and future needs. Design criteria for the architectures include:

--openness, i.e. the creation of an environment in which multi-vendor systems can be supported. In this context, the architectures will be ISO-OSI compatible.

--protection of existing investment--i.e., migration paths will be identified from present to future implementations.

--capability for progressive implementation, with special attention to the needs of SMEs /small and medium-sized enterprises/.

--applicability across a wide spectrum of industry.

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CAP GEMINI (BELGIUM)	GEC	UK
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	CRI A/S	Denmark
	Digital	Germany
	ICL	UK
	Philips & MBLE	Belgium
	Selenia	Italy
	Italsiel	Italy
	AEG-Telefunken	Germany
	Dornier System GMBH	Germany
	IMB Europe	Germany
	AT&T en Philips	NL
	Volkswagen AG	Germany"

THE ESPRIT I.E.S., a 12-page publication, discusses the Information Exchange and Data Communication System being designed to ensure communications between

the many ESPRIT participants. The booklet explains that "all participants in R&D projects, and indeed many others such as Member States' administrations, require regular access to documentary information about ESPRIT itself, about the various technical areas concerned, and about corresponding activities elsewhere." The final project description from THE ESPRIT I.E.S. in English p 12 reads as follows:

ESPRIT Encryption Mechanisms

"Investigation of the ESPRIT Community's requirements for an encryption mechanism for data exchanged through the ESPRIT IES, together with the key management and distribution system required, and ways of meeting these requirements.

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/12228
CSO: 3698/A122-E

BRIEFS

FRENCH EVALUATING RESEARCH--"Audits," that is to say evaluations of the activities of the large research institutes will take place soon in France. This is the decision announced by Hubert Curien to the Higher Council for Research and Technology (CSRT) during its plenary session in Lille in early February. The first evaluations in 1986 will address the National Center for Scientific Research (CNRS), the Atomic Energy Commission (CEA), the National Institute for Research in Data Processing and Automation (INRIA), and the National Agency for the Implementation of Research (ANVAR). There will also be evaluations of some major programs including space, nuclear generation of electricity, energy management ground transportation, mechanics, the electronics sector, and aid to the Third World. Moreover, the minister of research and technology would like to obtain a number of complementary files from the National Center for Space Studies (CNES). The objective is to provide a "better-supported" justification for the choice of manned spacecraft and a more accurate definition of the technological capabilities and resources that France still needs to acquire. The CSRT has also asked the CNES for a cost-benefit analysis on both the economic level (for example, the manufacture of materials in space) and the scientific level. [Text] [Paris SCIENCES & AVENIR in French Mar 86 p 14] 25006/6662

EEC SPONSORS VENTURE CAPITAL--The venture capital idea was launched in Brussels during a recent congress at the ULB [Free University of Brussels] regarding the European ESPRIT and EUREKA programs. It was adopted by the European Commission, which at the end of last January placed its Spanish colleague, Abel Matutes, in charge of the file. The objective is to create a venture capital fund under the initiative of the Commission and also in conjunction with private enterprise. Eurotech Capital would be quoted on the stock exchange. Share holdings caould not exceed 30 percent so that control of recipient companies can be avoided, while still allowing shareholders to profit from any successes. The initial capital of 500 million ECU [European Currency Unit] would be principally underwritten by institutional investors. Later, but only later, would investment be open to the public. The project will not stop there. The Commission also plans to establish an insurance organization for partial (up to 50 percent) protection against possible losses. [Text] [Paris ZERO UN INFORMATIQUE HEBDO BELGIUM in French and Dutch 3 Mar 86 p 6] 25021/12948

EUREKA OVERSIGHT ESTABLISHED--On Wednesday 26 February 1986, the French cabinet approved an order to create an interministerial EUREKA Committee. Headed by the prime minister and composed of relevant ministers, the committee will follow all projects involving French partners. It will have the services of a permanent secretary general who will be responsible for the preparation and the follow-up of the committee's decisions. Yves Sillard, general armaments engineer and chairman of the French Institute for Research and Exploitation of the Seas, has been named to this position. "The government will therefore be able to play the stimulating and supportive role it should have in overseeing the EUREKA project," reads the cabinet's report. [Text] [Paris ZERO UN INFORMATIQUE HEBDO in French 3 March 86 p 8] 25021/12948

EC STATUTES SET R&D PARTICIPATION--Cooperation on research and technology, even with outside nations such as Sweden, is now being written into the EC statutes, the Treaty of Rome. Up to now the growing technology cooperation in the EC has been undertaken without being anchored in the fundamental EC document. After the national referendum in Denmark, EC's members have now adopted the "reform package" which is to accelerate cooperation between the 12 member nations. For technical research and development the "package" means that 11 new sections are written into the Treaty of Rome, and one new rule for decisions: The Council of Ministers unanimously establishes goals and priorities for long-range framework programs. Unanimity means that individual countries can veto the overall goals. After that the Council of Ministers can adopt, with a two-thirds majority, special programs for telecommunications or biotechnology, for example, that is to say without veto powers. Individual member nations which desire cooperation can also agree on supplementary development programs. A new formulation in the Treaty of Rome gives non-members the right and opportunity to participate in EC research and development programs, an opening on paper toward Sweden, for example. Other features in the "package" provide for greater authority for the EC court to prohibit various technical trade barriers. For Swedish companies this could mean demands for adaptation to norms and specifications, over which one has very limited influence. The "reform package" is not likely to cause any decisive changes, however. As NY TEKNIK reported earlier, Swedish companies and authorities have already gotten a foot in the door in research programs such as Race (broadband communications) and Esprit (information technology) without being formally welcomed in the Treaty of Rome. [Text] [Stockholm NY TEKNIK in Swedish 20 Mar 86 p 6] 11949

CSO: 3698/413

FRENCH OPENING VLSI FACTORY IN PRC

Paris L'USINE NOUVELLE in French 27 Feb 86 p 38

[Article by Alain Dieul: "French VLSI Circuits Will Be Produced in China"; first paragraph is L'USINE NOUVELLE introduction]

[Text] Under the sponsorship of CNET-Grenoble, a center for the design of VLSI [Very Large-Scale Integration] circuits will be set up in the People's Republic of China. This achievement should clear the way for negotiations for new orders in telecommunications.

"Beginning this April, the agreement signed by SOFRECOM [French Company for R&D on Telecommunications Equipment] and the People's Republic of China will go into effect, an agreement on the establishment of a design center for VLSI circuits in Wuxi, near Shanghai," Michel Camus, director of the National Center for Telecommunications Studies (CNET) in Grenoble, declared last week.

The CNET is responsible for all intangible services, from the definition to the start-up of the center, and for the related transfers of scientific and technological knowledge. "In an investment which borders on half a billion French francs, CNET's contribution will represent approximately Fr 70 million. Twenty million will go to APSIS, a small company in Meylan to which the CAD (Computer-Aided Deisgn) training will be subcontracted, while the Cassiopee software will be supplied by the CNET," explains Michel Camus.

The transfer also involves a production line of VLSI-MOS [Metal Oxide Semiconductor] circuits with a 2-micron line width. It should be noted here that the CNET owns all the technology used at the Norbert-Segard microelectronics research center in Grenoble, a very important asset in international relations.

Regarding the machinery in the Wuxi center, the Chinese themselves will provide the equipment specified by the CNET. The contract, which extends over a 3-year period, provides for an on-site operation for the end of 1988 to help the Chinese engineers put the machines into service. This agreement is more of a beginning than an end in itself: It is part of a much broader negotiation covering the provision of 100,000 telephone lines to the city of Beijing by the Alcatel-Thomson company. This event should clear the way for further negotiations concerning new industrial orders in the telecommunications field.

The Wuxi center will be modeled after the one in Grenoble, where a second block of buildings is now being built. Michel Camus declared, "Thanks to this additional space, we will be able to renew our manpower increases. CNET management continues to invest in the Norbert-Segard center. Our pilot workshop is twofold: the production of integrated circuits, and, most importantly, the development of new production techniques.

The main objective for this year remains the development of micron-level CMOS [Complementary Metal Oxide Semiconductor] technology suited to analog and digital telecommunications which is essential for the transmission of sound and video.

25033/12948
CSO: 3698/A092

BRIEFS

TRONDHEIM TECHNOLOGY PARK--The company Technology Park, Inc, has been founded in Trondheim and has as its goal the creation of a professional environment for profitable technological operations. Behind the company stand United Insurance, the Commercial Bank, the Foundation for Industrial and Technical Research (SINTEF), the Savings Bank of Central Norway, the Sor-Trondelag county council, and the Trondheim council. The company has at its disposal a 25-acre lot: 100,000 square meters can be developed. Technology Park yesterday launched the campaign "Trondheim--Capital of Technology" with Trondheim mayor Per Berge as the nominal head. The campaign is directed primarily at the large, information-based manufacturing firms. [Text] [Oslo AFTENPOSTEN in Norwegian 17 Apr 86 p 43] 12327

CSO: 3698/0419

GDR MICROBIOLOGY INSTITUTE COOPERATES WITH CSSR BIOPHYSICS INSTITUTE

East Berlin SPECTRUM in German No 11, 1985 p 25

[Article by Guenter Loeber, Dr habil, Central Institute for Microbiology and Experimental Therapy: "Phases of Successful Cooperation"]

[Text] In a cooperative effort of nearly fifteen years between the Central Institute for Microbiology and Experimental Therapy in Jena and the Institute for Biophysics in Brno, ten scientists made up the international research collective. The cooperation can be divided into three segments, each of which gives evidence of the trend away from basic research toward applied research and which interlink.

In the first phase, representing the start of the joint effort, a study was made of the interaction of active ingredients, such as acridines, ethidium bromide, phenosafranine et al. with nucleic acids and nucleic acid models. This was a direction which at the beginning of the seventies corresponded to the international trend. These research efforts yielded the first description of the various bond types during the interaction of active ingredients with nucleic acids plus the compilation of steric combination models. When examining the combination in the presence of organic solvents it was observed that the high degree of stability of active ingredient-nucleic acid-adducts occurs only in water. Practically all of the solvents, but particularly the dissolving intermediaries frequently used in biological experiments, namely dimethyl formamide or dimethyl sulfoxide, considerably reduced the bond affinity, a finding which must be taken into account for respective tests with solubilizers. When analyzing the combination of antitumor antibiotica of the anthracyclene type with deoxyribonuleic acid (DNA) and chromatin it was found that the mentioned active ingredients lift off the DNA coiled around the histone nucleus in the nucleosome of the chromatin. This effect increases with the strength of the bond and can be correlated to the action of the nuclease decomposition. The research scientists from Jena and Brno were able to demonstrate, on the other hand, that the antitumor effect is not immediately reconcilable with the DNA-combination of the anthracyclenes. The search for alternative effect potentials, with the inclusion of the cyclic nucleotide system and the cell membrane, determines the research structure of cooperation in this direction today.

The second collaborative phase Brno - Jena concerned the interpretation of coloring patterns when staining eukaryotic (also human) metaphase chromosomes with giemsa stain or quinacrine. Findings from spectroscopic studies of stain-DNA-adducts permitted an extensive analysis of the chromosomal band patterns; thus it was observed that adenine-thymine-enriched DNA is present in the chromosome bands and the quinacrine stain is fluorescent only here.

The results formed the basis for continued studies with the Institute for Anthropology and Human Genetics as well as with the Dermatology Clinic of the Friedrich Schiller University Jena and the medical faculty of Purkyne University in Brno. The possibilities for detailed chromosome analysis were employed to determine chromosomal aberrations under the effect of active ingredients.

This is the direct transition to the third phase of collaboration which dealt with the combined effect of psoralens, e.g., methoxsalen, and ultraviolet light upon DNA and cellular systems. In physicochemical experiments it was possible to identify the different types of the covalent bond of psoralen to DNA. The inactivation of bacterial and animal viruses, but also of bacteria such as escherichia coli through psoralen plus ultraviolet light is casually determined from the modified DNA. In the case of phagen lambda it was possible to demonstrate that one significant step toward inactivation of bacteriophages is the fact that the DNA cross-linked by psoralens can no longer leave the bacteriophage head (blocking the injection into the host).

The use of psoralens in photochemotherapy for skin diseases (PUVA-therapy of psoriasis) immediately raises the question, of course, whether the combined treatment will cause chromosome damage. In the case of chromosomes from in vitro cultivated human lymphocytes this is clearly the case. It is interesting to note that the chromosomes from lymphocytes of psoriatic patients exhibit a lower degree of damage than chromosomes from those with a history of good health. Chromosomes from patients who received PUVA-therapy, on the other hand, exhibit only minor, insignificant modifications. These findings and other studies regarding PUVA-effect upon membranes were the foundation for the creation of the "Pharmaka-project" within the limits of the RGW-(Council of Mutual Economic Assistance) biophysics program with the present participation of the USSR, GDR, CSSR and UVR with approximately 15 Institutes and 40 scientists.

The community Brno - Jena, with joint publications, papers and scientific events, has contributed to the intensification of the exchange of know-how in the fields of nucleic acid and pharmacobiophysics within the RGW-states and thus made a contribution to the scientific-technical integration of the socialist countries. The organization of three international scientific conferences was a joint project by fellow workers in the community. At present, the 7th RGW-conference "Biophysics of Nucleic Acids and Proteins," to be held from 2 to 6 December 1985 in Brno, is being prepared. In May 1984, the fellow workers from Jena and Brno received a joint award of the first category from the AdW (Academy of Science) and CSAV for their performance.

The cooperative relationship between the two academies has now existed for 30 years. On 29 October 1955 the Academies of Science of the CSSR and GDR signed an "agreement on the guidelines of mutual scientific cooperation." For our academy this constituted the first agreement for scientific collaboration with a friendly academy since the establishment of the GDR.

13011/12859
CSO: 2302/11

BASIC DATA ON POLISH INFORMATICS CENTERS

Warsaw WIADOMOSCI STATYSTYCZNE in Polish No 11, Nov 85 p 36

[Article by Dr Jan Iszkowski, Research and Development Center, National Statistical Data System, Central Office of Statistics: "Informatics in Statistics: Statistical Data on Informatics Centers"]

[Text] The Research and Development Center of the National Statistical Data System (SPIS) makes an annual study of the status and utilization of informatics centers. The detailed results of this study have been presented in a publication entitled "Informatyka i osrodki informatyki w 1984 r." [Informatics and Informatics Centers in 1984]. This publication was issued in the series "Opracowania Statystyczne" [Statistical Studies].

The following tables include basic data on informatics centers over the 1980-1984 period.

Table 1. Informatics Centers in 1984

(1) Wyszczególnienie	1980	1981	1982	1983	1984	1984	
						1983 = 100	1980 = 100
(2) **Liczba ośrodków informatyki**							
(3) **Ogółem**	**1599**	**1575**	**1432**	**1403**	**1399**	**99,7**	**87,5**
(4) w tym ośrodki:							
(5) Wyposażone w komputery	1063	1072	1061	1059	1090	102,9	102,5
(6) Nie mające żadnego sprzętu	41	33	17	11	10	90,9	23,4
(7) Samodzielnie bilansujące	117	144	148	152	114	97,4	75,0
(8) Prowadzące działalność w zakresie:							
(9) projektowania i programowania systemów na komputery	991	971	921	899	915	101,8	92,3
(10) przetwarzania danych na komputerach	966	978	955	947	958	101,2	99,2
(11) tworzenia maszynowych nośników informacji	1274	1205	1038	1013	1000	98,7	78,5
(12) koordynacji prac w zakresie informatyki	508	500	352	347	349	100,6	68,7
(13) instalacji, konserwacji i remontów komputerów	329	332	369	387	404	104,4	122,8
(14) **Zatrudnienie w ośrodkach informatyki**							
(15) **Pracownicy ogółem** (w tys.)	**56,4**	**51,3**	**46,0**	**45,1**	**44,7**	**99,1**	**79,3**
(16) w tym:							
(17) — projektanci systemów i analitycy	6,7	5,9	5,0	4,8	4,6	95,8	68,7
(18) — programiści	6,8	6,2	5,2	4,8	4,8	100,0	70,6
(19) — operatorzy	20,4	18,4	17,0	17,0	17,0	100,0	83,3
(20) — konserwatorzy	5,5	5,4	4,9	4,8	4,8	100,0	87,3
(21) Pracownicy na 1 ośrodek (w osobach)	35,3	32,6	32,1	32,1	32,0	99,7	90,7
(22) Pracownicy ośrodków samodzielnie bilansujących (w tys.)	23,3	22,5	20,5	20,2	16,3	80,7	70,0

(23) Wyposażenie techniczne ośrodków informatyki

(24)	**Komputery ogółem** (o pojemności pamięci wewnętrznej od 8 Kb (w szt)	**2633**	**2633**	**2553**	**2648**	**2844**	**107,4**	**108,0**
(25)	Według klas pojemności pamięci wewnętrznej (w szt):							
(26)	8 do 64 Kb	1736	1906	1813	1841	1950	105,9	112,3
(27)	65 do 256 Kb	568	485	483	484	506	104,5	89,1
(28)	257 do 512 Kb	279	204	209	231	222	96,1	79,6
(29)	powyżej 512 Kb	30	38	48	92	166	180,4	553,3
(30)	Komputery duże i średnie według klas wieku:	857	874	829	833	842	101,1	98,3
(31)	1 do 3 lat	157	109	49	30	40	133,3	25,5
(32)	4 do 5 lat	195	150	129	83	43	51,8	22,1
(33)	6 do 8 lat	325	355	317	278	213	76,6	65,5
(34)	9 do 10 lat	95	139	193	233	248	106,4	261,1
(35)	powyżej 10 lat	85	115	141	209	298	142,6	350,6
(36)	Przeciętny wiek	6	7	8	9	9	.	.
(37)	Komputery duże i średnie w eksploatacji	813	841	803	811	813	100,2	100,0
(38)	Minikomputery	1776	1759	1724	1795	2002	111,5	112,6
(39)	według klas wieku:							
(40)	1 do 3 lat	518	499	424	304	431	141,8	83,2
(41)	4 do 5 lat	442	291	352	450	380	84,4	86,0
(42)	6 do 8 lat	786	831	656	474	453	95,6	57,6
(43)	9 do 10 lat	30	127	255	449	482	107,3	2460
(44)	powyżej 10 lat		11	37	118	256	216,9	
(45)	Przeciętny wiek	5	5	6	6	7	116,7	140,0
(46)	Minikomputery w eksploatacji	1570	1549	1511	1587	1761	111,0	112,2
(47)	**Urządzenia wejścia-wyjścia komputerów**							
(48)	Urządzenia wejścia	3502	3375	3240	3857	4388	113,8	125,3
(49)	w tym czytniki:							
(50)	kart	1199	1218	1207	1202	1172	97,5	97,7
(51)	taśmy papierowej	2038	1906	1734	1662	1611	96,9	79,0

(1) Wyszczególnienie	1980	1981	1982	1983	1984	1984	
						1983=100	1980=100

(52) Wyposażenie techniczne ośrodków informatyki (dok.)

(53)	Urządzenia wyjścia	5452	5505	5398	5376	5583	103,9	102,4
(54)	w tym:							
(55)	dziurkarki	1806	1717	1538	1596	1591	99,7	88,1
(56)	drukarki	2666	2247	2762	3081	3267	106,0	122,5
(57)	monitory ekranowe	463	354	439	383	418	109,1	90,3
(58)	Urządzenia wejścia-wyjścia (bez przewijaków taśm i transportów dysków)	2487	2554	2773	2575	2697	104,7	119,3
(59)	Przewijaki taśm	.	4762	4989	5105	5216	102,2	.
(60)	Transporty dysków	.	3336	3897	4566	5291	115,9	.
(61)	**Urządzenia do przygotowywania maszynowych nośników danych**							
(62)	Rejestratory danych	508	665	669	974	1150	118,1	226,4
(63)	Dziurkarki i sprawdzarki kart	10798	10553	9444	8997	8445	93,9	78,2
(64)	Maszyny księgujące, fakturujące, automaty obrachunkowe	4189	3304	3072	3083	2645	85,8	63,1
(65)	**Urządzenia transmisji danych**							
(66)	końcówki inteligentne	59	70	77	104	131	126,0	222,0
(67)	końcówki nieinteligentne	2910	3744	4319	4485	4832	107,7	166,0
(68)	w tym dialogowe	2447	3303	3852	3993	4394	110,0	179,6
(69)	Urządzenia sterujące transmisją danych	430	511	654	746	865	116,0	201,2
(70)	Konwertory sygnałów binarnych	1865	2146	2328	2305	2390	103,7	128,2

(71) Wskaźniki wykorzystania i struktura czasu pracy komputerów w godzinach

(72)	**Przeciętny czas wykorzystania komputerów w ciągu doby roboczej**							
(73)	Komputery duże i średnie	13,1	13,1	13,1	13,2	13,5	102,3	103,1
(74)	Minikomputery	6,3	6,5	6,5	6,7	6,8	101,5	107,9

Key:

1. Item
2. Number of informatics centers
3. Total
4. Including centers:
5. Equipped with computers
6. Having no equipment of their own
7. Independent accounting centers
8. Active in the area of:
9. Computer-assisted systems planning and design
10. Computer data processing
11. Creation of mechanical information media
12. Coordination of work in area of informatics
13. Computer installation, maintenance, and repair
14. Employment at informatics centers
15. Total personnel (thousands)
16. Including:
17. Systems designers and analysts
18. Programmers
19. Operators
20. Maintenance personnel
21. Employment per center (individuals)
22. Employment at independent accounting centers (thousands)
23. Technical equipment of informatics centers
24. Total computers (with internal memory capacity of 8 kilobytes)(number)
25. By internal memory capacity category (number)
26. 8 to 64 kilobytes
27. 65 to 256 kilobytes
28. 257 to 512 kilobytes
29. over 512 kilobytes
30. Large and medium-sized computers by age category
31. 1 to 3 years old
32. 4 to 5 years old
33. 6 to 8 years old
34. 9 to 10 years old
35. over 10 years old
36. Average age
37. Large and medium-sized computers in service
38. Minicomputers
39. By age category
40. 1 to 3 years old
41. 4 to 5 years old
42. 6 to 8 years old
43. 9 to 10 years old
44. Over 10 years old
45. Average age
46. Minicomputers in service
47. Computer input-output devices
48. Input devices
49. Including:
50. Card readers
51. Paper tape readers
52. Technical equipment of informatics centers (continued)
53. Output devices
54. Including:
55. Punches
56. Printers
57. Screen monitors
58. Input-output devices (except tape drives and disk drives)
59. Tape drives
60. Disk drives
61. Devices for preparation of mechanical data media
62. Data recorders
63. Card punches and verifiers
64. Accounting machines, invoicing machines, automatic calculators
65. Data transmission devices
66. Smart terminals
67. Dumb terminals
68. Including dialogue terminals
69. Data transmission control devices
70. Binary signal converters
71. Coefficient of utilization and operating time of computers in hours
72. Average time of computer use during work day
73. Large and medium-sized computers
74. Minicomputers

Table 2. Computer Work Time Structure in Percent

(1) Wyszczególnienie	1980	1981	1982	1983	1984	(2) Różnica w pkt. 1984 do	
						1983	1980
(3) Struktura wykorzystania czasu pracy komputerów							
(4) Komputery duże i średnie — łączny czas przepracowany i nie przepracowany	100,0	100,0	100,0	100,0	100,0	—	—
(5) w tym przestoje	16,9	20,8	20,7	21,2	20,2	−1,0	+3,3
(6) w tym z przyczyn organizacyjnych	8,6	12,9	13,5	13,5	13,2	−0,3	+4,6
(7) Minikomputery — łączny czas przepracowany i nie przepracowany	100,0	100,0	100,0	100,0	100,0	—	—
(8) w tym przestoje	32,5	33,6	33,2	32,1	30,0	−2,1	−2,5
(9) w tym z przyczyn organizacyjnych	15,2	16,9	17,0	17,2	15,3	−1,9	+0,1
(10) Struktura czasu pracy komputerów według tematyki opracowań							
(11) Ogółem	100,0	100,0	100,0	100,0	100,0	—	—
(12) automatyzacja procesów technologicznych	16,7	16,7	14,3	13,1	12,4	−0,7	−4,3
(13) automatyzacja prac zawodowych	17,1	17,1	18,6	18,5	18,9	+0,4	+1,8
(14) zarządzanie	66,2	66,2	67,1	68,4	68,7	+0,3	+2,5
(15) w tym:							
(16) systemy wielodziedzinowe	4,0	3,8	4,1	4,2	3,9	−0,3	−0,1
(17) przygotowanie, planowanie i kontrola wykonania planów	6,6	6,2	6,2	6,6	6,6	0,0	0,0
(18) gospodarka materiałowa	12,8	12,8	12,8	13,0	12,4	−0,6	−0,4
(19) gospodarka wyrobami	5,2	5,1	5,3	5,5	5,7	+0,2	+0,5
(20) gospodarka środkami trwałymi	2,2	2,3	2,0	2,1	2,1	0,0	−0,1
(21) rozliczenia finansowe	14,6	14,6	16,9	17,4	17,0	−0,4	+2,4
(22) gospodarka kadrowa	4,0	4,0	4,4	3,9	4,2	+0,3	+0,2
(23) statystyka i analizy ekonomiczne	8,4	7,4	6,9	6,5	7,0	+0,5	−1,4

Key:

1. Item
2. Percentage difference, 1984 relative to:
3. Computer work time utilization structure
4. Large and medium-sized computers, total time, worked and not worked
5. Including down time
6. Including down for organizational reasons
7. Minicomputers, total time, worked and not worked
8. Including down time
9. Including down for organizational reasons
10. Computer work time structure by subject treated
11. Total
12. Automation of production processes
13. Automation of plant operation
14. Administration
15. Including:
16. Multiple-area systems
17. Preparation, planning, and monitoring of plan implementation
18. Materials management
19. Product management
20. Fixed asset management
21. Financial calculations
22. Personnel management
23. Statistics and economic analyses

6115
CSO: 2602/31

ELECTION OF OFFICERS OF HUNGARIAN COMPUTER SCIENCES SOCIETY

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 pp 1, 3

[Article by Mrs Istvan Toth: "Election of Officers; Neumann General Assembly 1985"]

[Text] True to a tradition of many years the NJSZT [Janos Neumann Computer Sciences Society] held its 1985 general assembly in the Congress Hall of the Academy on 27 November.

Taking their places in the presidium were Tibor Vamos, president, Dr Laszlo Jeki, deputy first secretary of the MTESZ [Federation of Technical and Scientific Associations], first secretary Gyozo Kovacs, Balint Domolki, Ivan Kadar and J. Gyula Obadovics, vice-presidents, Janos Szelezsan and Gyorgy Vasvari, deputy first secretaries, Laszlo Ormai, chairman of the Control Committee, and Ivan Patachich, leader of the music work committee of the Society. The members of the presidium and the organizers--who, let us admit it, had often grieved over the many empty chairs--happily acknowledged that this time extra chairs had to brought into the crowded hall.

The locale was the customary one and the name of the event, "general assembly," figures on the schedule of the Society every year. What made the event different, an event repeated every year as the association reports on the activity carried out in the given year and proposes tasks for the coming year, is to be sought in the two words modifying "general assembly"--"election of officers" and "delegate."

Ten Years of Professional Work

This delegate general assembly was a milestone in the life of the Society. They were saying farewell to a staff of officers which had worked officially since 1980 but actually since 1975, because at the 1980 elections the old leadership was re-elected almost in its entirety for another 5 years. Thus the presidium not only had to report on the activity of the last year but also on the entire period during which it had guided the affairs of the Society as the elected leader. Almost every organizational unit of the Society contributed to this "accounting"--the special departments, the regional organizations and the work committees. During the fall these units held their general assemblies where they evaluated their work and elected their leaderships. According to

the statutes of the Society the leaders of the special departments and regional organizations are ex officio members of the National Presidium, so they were known to the delegate general assembly. The nearly 4,000 individual members and 150 legal members sent 438 delegates who had the honored task of representing the membership in the selection of the elected members of the 85 person presidium, the members of the control and disciplinary committees and the delegates who will represent the NJSZT at the MTESZ congress to be held in May 1986.

After the opening by Tibor Vamos the first secretary's report by Gyozo Kovacs outlined the last 10 years in the "history" of the Society. He called the period 1975-1980 the childhood and the period 1981-1985 the youth of the Society, in the last period of which the NJSZT had strengthened greatly.

The presidium had tried to guide the activity of the Society in accordance with the following basic principles adopted 10 years ago:

--within the framework of the Society one could deal with any sort of computer technology theme (even those for which there was no opportunity within work frameworks);

--in the Society the leaders and members of the Society do not represent their places of work or the positions of their places of work but rather their own opinions;

--the leadership of the NJSZT cannot ignore the opinion of the membership by fiat; free expression of opinion and a democratic spirit will reign in the life of the Society;

--the organization is deliberately decentralized, which means that the several special departments and especially the regional organizations carry out their activity with great independence. The central leadership indicates the chief directions of work with a collective resolution; it does not have a say in details.

And how should one evaluate the results? Here are a few quotations from the written report and verbal supplementation of the first secretary: "We have dealt with practically everything during the 10 years. By organizing conferences, study courses, seminars, exhibits and lectures the special committees deliberately undertook that work which has made the society, in a certain sense and to a certain degree, the vanguard of computer technology experts.

"Among the chief authorities responsible for the profession the OMFB [National Technical Development Committee], the KSH [Central Statistics Office], the Hungarian Academy of Sciences and most recently the Ministry of Culture have constantly requested and still request the opinion of the NJSZT in questions affecting the profession. In general they have accepted our recommendations, we can find them in the decrees and studies which have appeared, so we can say without immodesty that the NJSZT has entered the ranks of organizations forming computer technology policy."

"The county organizations were formed by 1980 and their membership began to increase constantly. In accordance with the traditions of the MTESZ independent city organizations were formed--in Sopron, Esztergom and Szentendre.

"In years past our most significant forums, the 1979 and 1983 congresses, and a number of important and often international programs of the special departments have been held in some provincial city. This was favorable for both the special departments and the guests, because they could get to know not only Budapest but other parts of the country and, of course, the professional work taking place there. This sort of cooperation was very useful for the regional organizations and for the experts living there because in this way they could be linked directly into scientific life.

"We participate in editing the journals SZAMITASTECHNIKA and INFORMACIO ELEKTRONIKA, although it is true that the level of activity of the NJSZT in editing the journals leaves rather much to be desired. We subscribed to SZAMITASTECHNIKA as a membership journal and thus solved the publication problems. Only in 1983 did we start our own paper, the MIKROSZAMITOGEP MAGAZIN, which does not compete with the two earlier journals but is intended for a different reading public with entirely different content. Now the members can choose which journal to request as a membership journal. We have also solved the problem of providing society information.

"Our international contacts have broadened. The role we have undertaken in the IFIP is increasingly significant, as indicated not only by the increasing number of IFIP programs but also by the fact that NJSZT members are receiving important roles in the technical committees and work groups of the IFIP. In the French-Hungarian electronics and informatics mixed committee the NJSZT is the Hungarian representative in the society informatics work group. It must be noted here that we have signed cooperation agreements with the OCG (Osterreichische Computer Gesellschaft) and with the Slovak Cybernetics Society, we have regular contact with the Greek Computer Society and cooperation is developing with the Popov Society in Moscow and we have signed contracts with the Bulgarian Komsomol and with the French X2000 Foundation. These contacts and conferences which bring in foreign exchange are making foreign travel possible for more and more NJSZT members.

"We spent the last 2 years cultivating the 'socialization of computer technology.' Among the achievements we must mention that even students and soldiers have entered the ranks of our members, we should mention our exhibits and competitions held in Budapest and in the provinces, the initiation of the MIcro-Club movement and the beginning of informatics remote instruction. One of the most important events of this program will be the Micro '86 Festival which we would like to hold as the first national meeting of the Micro-Clubs. We will repeat the SZMSZM (computer technology for everyone, computer technology is everyone's) exhibit, we are organizing computer technology film showings and we will demonstrate the machines built in the HCC, even the 'old' computers collected thus far. We would like to hold a festival which will sum

up the results achieved by the NJSZT and, of course, in the social programs of all cooperating institutions."

In conclusion the first secretary expressed thanks for the 10 years of support.

In his not at all formal report Laszlo Ormai, chairman of the Control Committee, said that the Committee constantly supervized the operation of the Society according to the Statutes and its management of assets. The first actually meant that they watched the role played by the NJSZT in making the domestic development and use of computer technology more effective. He stressed the flexibility of the leadership and its receptiveness to the new. The more active activity of the Society also significantly increased the flow of money. Management discipline was satisfactory. The only unsolved problem--primarily a legal one--is payment of membership dues.

He designated as tasks for the future increasing the "effective circle" of the Society, support for the program to spread electronics and increasing the number of members.

Comments

The comments in the debate of the reports partly reported on achievements and partly made proposals for additional tasks. Peter Kovacs stressed the importance of strengthening international contacts; Denes Varga recommended encouraging the broadcast of programs on the radio and the organization of a conference in Hungary dealing with computer linguistics; Imre Margitics saw in the creation of a prime contracting office a way to increase the material possibilities of the Society. According to Lajos Nagy the NJSZT should be both a mass organization and a vanguard; Ferenc Nagy felt it important to cultivate the Neumann traditions. The words of Zoltan Torok asked a solution to the problems of the HCC club.

Laszlo Jeki honored with praising words the role of the Society which "is outstanding in every way among the 32 MTESZ associations. Its leadership recognized in time the needs being brought to the fore by the science. It participated creatively in developing computer technology policy and was active in implementing it." Finally he praised the activity of Tibor Vamos who, as a member of the Executive Committee of the MTESZ, chairman of the Social Policy Committee and leader of the IMPULZUS editorial committee, is a personality determining the activity of the MTESZ.

Modification of Statutes

The statutes underwent certain modifications because of the change in the social status of the MTESZ, because of a difference between the practice followed in the life of the society and parts of the statutes and because of a few imprecise formulations. The Statutes Committee submitted the changes to the Management and then to the National Presidium. Everyone got these--together with the original text of the statutes--and the chairman released them for debate.

In addition to several stylistic recommendations (which were accepted unanimously) there were a few recommendations of principle as well. Some of the latter (the possibility of forming factory groups, frequency of elections, etc.) were taken care of by the General Assembly, but the presidium will have to work out a recommendation in regard to two questions:

--changing the name of the Society (they objected to the word "computer sciences") is timely, so after suitable preparation the question will be submitted to the 1986 general assembly; and

--the election mechanism must be made more democratic.

The managing Presidium had asked in June that the nominating committee make recommendations for members of the presidium to be elected. A number of supplements were made to the proposal.

The voting sheet in the hands of the delegates which contained the recommendations for the 45 elected members of the National Presidium was developed after several rounds of refinement. Robert Peller, chairman of the nominating committee, described the course of the elections in accordance with the Statutes.

While the votes were being counted the recipients were awarded the Neumann and Kalmar medals and the names of those receiving awards for their year's work were read. The General Assembly received with loud applause the news that first secretary Gyozo Kovacs had won the MTESZ prize.

After a break the chairman of the vote collection committee, Laszlo Gyimesi, announced the composition of the presidium. The presidium immediately held its first meeting (during which composer Ivan Patachich, leader of the Music Work Committee formed in the NJSZT one year ago, gave a talk titled "Music and Informatics") and elected the leading staff:

President: Balint Domolki,
Vice-Presidents: Gyozo Kovacs, J. Gyula Obadovics and Janos Szelezsan,
First Secretary: Miklos Havass,
Deputy First Secretaries: Katalin Tarnay and Gyorgy Vasvari.

Winners of Neumann Prize

Gyorgy Borbath, leader of the Organization Main Department of Ganz-Mavag. He has worked for nearly 10 years in the Systems Organization and Informatics Special Department; the organization of a number of successful and important programs is linked with his name. He has been active in the area of enterprise applications of computer technology for more than two decades.

Dr Laszlo Ormai, leader of the Statistical Systems Development and Coordinating Main Department of the KSH. He is one of the domestic pioneers in the statistical application of computer technology and has been active in this for several decades. His role in the domestic propagation of computer technology culture has been significant also. He has done active work in the NJSZT as chairman of the Control Committee.

Laszlo Leitner, directer of the Kecskemet center of the SZUV [Computer Technology and Management Organization Enterprise]. He has done much for the spread of computer technology culture in Bacs-Kiskun County (computer technology competitions, the Baja computer technology camp, the logic club, the microcomputer club). The circle of enterprise users within the state administrative special group came into being with his cooperation.

Winners of Kalmar Prize

Dr Tamas Legendi, a scientific worker at the Academy Research Group in Szeged. He has achieved success in developing a cell processor which can be regarded as an independent new direction in cell automat research which to a large extent makes possible parallel operations execution by computers; in addition to significant domestic applications this has also won international recognition.

Dr Attila Naszlady, university professor and chief physician at the Koranyi Institute. He is one of the domestic pioneers in medical science applications of computers. He has achieved outstanding results in complex internal medicine computer technology systems including computerized evaluation of ultrasonic pictures. He is one of the founding members of the Medical-Biological Special Department.

Dr Katalin Varga (Mrs Pasztor), a chief scientific worker at the MTA SZTAKI [Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences]. She was a graduate student of Laszlo Kalmar. Her scientific achievements are from the area of the "Kalmar school," many of them connected with minimization and computerized realization of the Boolean functions. She has successfully used mathematical logic to solve technical tasks.

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STATUS OF HUNGARIAN DOMESTIC SOFTWARE AT EXHIBIT ANALYZED

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 p 2

[Article by Dr I. Sz.: "It Was a Good Program, But..."]

[Text] Despite serious preparatory work, the software exhibit originally planned as a national one did not reflect a national character. Firms almost exclusively from the capital dominated the exhibit. Despite this, the experiences gathered here, it appears, are of national interest, all the more so since the goal of the organizers was to serve the entire national economy and the interests of all users. The extent to which this goal was realized cannot be measured directly. But the deficiencies discovered certainly limited effective realization, primarily because of the intensive nature of the program, which was not attended mainly by users. Secondarily it was because it did not give an answer or information in regard to many things. We are thinking, for example, of domestic documentation and the status of standardization in connection with software. On the basis of what was seen they are characterized most often by an exaggerated striving for unique solutions. We greatly missed an evaluation which would have compared the operational efficiency of--very expensive--software products prepared for similar or different devices. In addition to cheaper prices and good quality it might have represented a true commodity character and publicity too if they had posted in an easily readable way the number of individual products sold, a reference list and perhaps the names of the people who developed them.

Nor did the exhibit give an account as to whether the goods exhibited were the products of so-called real software manufacture, and thus representatives of a more rational path of development, or only individual ad hoc developments. In any case the latter is suspected. And the software people (interpreted concretely and more narrowly today as coders and programmers) working abroad for more than 10 years got their foreign work permits at that time with the supporting argument that, mastering a more developed technology, their experiences could be used in domestic software development and applications, in the development of machines and systems which were poorly equipped.

Karoly Pogany, directer of the Comporgan Systems House, said at the program's press conference that there was great justification in our country for software as a commodity. The question is the extent to which this applies to software for machines which grew out of toys from which one can hardly expect

help for the real tasks of the national economy. Unfortunately a very large proportion of the programs shown at the exhibit were prepared for such machines. As for what is determining in our country today in connection with software, business or real user interests, an analysis of that "would be worth a mass"! Unfortunately, on the basis of what was seen, one cannot even predict what sort of production and connected software development we will have by, for example, the year 2000, cannot predict whether it will become a commodity, cannot predict the restructuring of manpower or changes in the ratio of those doing intellectual work and software development therein.

The exhibit should have given an account of the status, structure and level of software available domestically. Unfortunately one could not even come to a conclusion about this and the percentage breakdown of products exhibited did not provide reliable base data either. But a comprehensive survey and presentation of the software available domestically would also have made possible conclusions regarding the efficient use of the computer technology tools available and might have shown a way for further progress, in the interest of taking over the achievements of each other as well.

Karoly Pogany also said that the requirements for selecting software have not yet developed in our country. The Systems House wants to move forward in this now and will soon be on the market with a service, a selection technology acquired from the world famous Diebold firm, which will help the user to choose both software and computer devices. We should hope that it will also help the next exhibit in regard to professional level and objectivity and in providing an answer as to how a product meets the special user requirements from the viewpoint of applications.

It would be interesting to reflect how the MSZR [Minicomputer System] meeting held in Szeged a few weeks earlier is related to this program and in this sense also whether the emphasis should not be placed on joint action instead of scattering our forces. And finally let us look at a list, without opinion or comment (!) and without regard to the in any case dubious compatibility questions, of the machines--even expensive ones--for which the participants offered software products: C-64; C-720; Primo (!); ZX Spectrum; ZX 81; M08X; Proper-8; Proper-16; Proper-16W; VT-16; VT-20; VT-20A; VPPC; VT-20/IV; IBM PC; IBM PC/XT; IBM PC/AT; PDP; TPA-11; TPA-1140; TPA-1148; TPA-11/440; Janus; TPA-L-128/H; Quadro; SZM-4; Comput-80; Professor; TAP-34; MC; RC-3600; Labsys-80; the "10080 CPU"; MOD-81M; Varyter-XT; Syster; Tekemu; Transmic-8; TZ80; TZ-80D; Multi-Center; TM-16; MXT; MXT-M; Multi-WS; Rair (!); Robotron A6401; A6402; 1355; 1711; 1720; 5100; PV 1715.

And, among the larger machines, they offered software for the following: ESZ 1035; ESZ 1040; ICL; IBM 3031; ESZ 1010; ESZ 1010M; Siemens 4004 and 7000; CDC 3300.

The Bulletin published by Comporgan and the attractive program catalog containing much data vouch for all this, and aided the cultured nature of the program.

Our editors would like to aid the goal of the organizers by publishing well founded professional criticism, for we are convinced that good criticism which intends to help is the cheapest form of consultation, even if it is not a commodity.

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THREE CONTRACTS SIGNED FOR HUNGARIAN SOFTWARE EXPORT, IMPORT

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 p 3

[Article by Nikifor Mihajlov: "Software Export and Import"]

[Text] The Software '86 exhibit not only offered an opportunity for domestic software manufacturers, vendors and end users to meet with one another but also for Hungarian software trade to take its first steps toward the socialist countries. The most striking part of this was the signing of three contracts by Metrimpex and the Elektronorgtechnika foreign trade enterprise, signed in the Hotel Duna Inter-Continental for the export of Hungarian software products and the import or support of Soviet software products.

Janus

For the first time in the history of Hungarian software trade there will be delivery of a finished software product within the Soviet Union. There have been deals in the Soviet Union before, but in general these pertained to development, to programs to be prepared on the basis of concrete customer needs. The first delivery of the Janus software product within the Soviet Union took place thanks to its market introduction at Software '86 by the National Software Archives and Tracking Service operating within the framework of the Computer Technology Applications Enterprise. Janus was prepared by workers of the Csepel Works Computer Technology Enterprise. With the aid of Janus--in a virtually unchanged form--one can run on ESZR [Uniform Computer Technology System] computers those program products which were developed on the ICL System-4 computer for the JDOS 1800 operating system. On the Soviet side the first--and hopefully not the last--user of this software product will be the Central Computer Center of the Soviet Union's Ministry of Supply, where they recently exchanged an old ICL machine for an ESZ 1055 in the course of a reconstruction. The deal totals 126,000 rubles.

PL/1 and SETOR

At the same time a foreign trade contract was signed pertaining to delivery of a new Soviet software product. This software product is the PL/1 translating program, which can be run on an SZM-1600 computer and which makes possible the source language transfer to an SZM-1600 computer of PL/1 programs running on old ESZR computers (ESZ 1020, ESZ 1022, ESZ 1030).

In 1984 the OSAK [National Software Archives and Tracking Service] purchased unlimited trade in Hungary of the SETOR/SM MSZR database management system, which has been sold so far to nine domestic enterprises. On the last day of Software '86 a software tracking contract was signed as a result of which these domestic enterprises and future purchasers can continue to enjoy the support of the Soviet developers--in accordance with the general practice of the OSAK--during and beyond the guarantee period. The tracking contract makes it possible for users of SETOR/SM in Hungary to obtain, by telephone, immediate answers to problems arising for them, free of charge within the guarantee period and for a tracking fee thereafter, and they can get access to newer versions of SETOR/SM. Metrimpex and Elektronorgtechnika and the experts of the Hungarian and Soviet enterprises involved in the contract all hope that with this tracking contract and with the work done within the framework of it there will be an end to the general notion that the tracking of software products coming from socialist countries is insoluble or unsolved. Of course, all this is a question of work, or money. The PL/1 and SETOR deals total about 80,000 rubles.

The signing of additional contracts pertaining to mutual deliveries may be expected in the near future.

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SURVEY REVEALS SHORTCOMINGS OF HUNGARIAN TELECOMMUNICATIONS SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 p 4

[Unsigned article: "Our Telecommunications and Our Telephone Supply"]

[Text] The following information comes from an interview given to NEPSZABADSAG by State Secretary Illes Toth, president of the Hungarian Post Office. The professional information taken from an authentic source offers a true picture of our telephone network and of planned developments.

Research is taking place throughout the world to measure the national economic utility of telecommunications. These studies are innumerable in the western countries. A number of studies have been prepared here also. It is worthy of note that although the study methods are not identical there is hardly any deviation in the calculations and conclusions. Soviet economists did a survey in 300 plants and established that every ruble invested on telecommunications resulted in 3.1 rubles savings in production each year and increased national income by 1.9 rubles. Taking all this into consideration the present Hungarian telephone situation probably causes 11-12 billion forints in economic damage each year.

International comparisons prove that from the quantitative, qualitative and service viewpoints, the Hungarian telephone [service] situation has slid down to the last group in Europe and its condition is not at all in harmony with the developmental level of the economy. There are 2,600 telephone exchanges in the country, half of the equipment is of the rotary type, some types are almost 100 years old. We purchased the crossbar system 17 years ago; since then we have been able to modernize only half of the telephone exchanges.

If we want to make progress we must spend a larger fraction of the national income on telecommunications than we have been. According to our present information we will spend 70 percent more on telephones in the next 5 years and will be doing 34 percent more construction than in the Sixth 5-Year Plan. All this means creating 280,000 telephone stations. Unfortunately the tension will not decrease even so. About 120,000 of the planned quantity will be turned to replacing scrapped units. If the plan stands, the telephone situation at the end of the decade will be worse than now, because development will not keep pace with the aging of the stock, the 400,000 now waiting for service will increase to 1.5 times that, and a person now at the end of the

line will get a telephone in 21 years, in 2007. Fortunately the planning work is not yet completed. The government intends to seek a solution for greater development, taking into consideration the material situation of the economy. (We have a special task in that we must soon switch to seven digit numbers in the capital and six digit numbers in the provinces.)

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REPORT ON NATIONAL MINICOMPUTER SOFTWARE MEETING

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 p 5

[Article by Gyongyi Rovo, OSAK: "Report on the Fourth National MSZR Software Meeting"]

[Text] On 28-29 October 1985 the National Software Archives and Tracking Service (OSAK) operating within the framework of the SZAMALK [Computer Technology Applications Enterprise] held the Fourth National MSZR [Minicomputer System] Software Meeting, a meeting which already can be regarded as traditional. There were foreign guests present in addition to a large number of Hungarian participants gathered to exchange views. Representatives of the Polish ZETO-ZOWAR and the English QUEST came with talks or demonstrations; it is expected that they will be serious partners of the OSAK in the future. Unfortunately the most important foreign partners of the OSAK even today, the Soviet software vendors, were represented at the meeting only by observers.

How the significance of the program has increased with the passage of time is proven by the some 65 SZM type computers operating in our country and the number of participants, which increases every year. The reason for this, as Dr Karoly Tandori, university professor and chairman of the Academy Committee in Szeged, said in his opening speech, a brief review of the history of computer technology, can be sought in the slowly increasing spread of minicomputer systems (a spread which, unfortunately, is slower than desired).

The chief theme was the SZM-4 (including machines compatible with it) but it seemed useful for people using smaller computers than this to take part in the meeting also. From this viewpoint the Fourth Meeting was an experiment in opening "downward" toward the microcomputers. The plans of the OSAK include having at the Fifth Meeting not only experts working in the area of MSZR computers but also those working the area of ESZR [Uniform Computer Technology System] computers and microcomputers.

The primary goal of the series of programs was to provide an opportunity for an exchange of experiences and reports on new achievements by the users of minicomputers, or the customers of the OSAK.

A description of applications systems prepared for the SZM-4 and of interest to a broader circle of OSAK customers took place in the first part before the roundtable discussion.

The MULTIFMS multi-terminal format control system of Volan Electronics described by Attila Soos will certainly be of interest to many users in the future. The system was developed because neither the FORM-11 or SERIES-IV have properties meeting the requirement that screen formats should be easily prescribed for data input, that terminals should be handled dynamically, and that they should operate independent of the file management system. In its developmental logic the system reminds one of the structure of the CICS large computer, real-time remote processing system; being independent of file managers also means that it can work with any file management or database management system (SETOR, RMS, DBMS).

Attila Haraszti, of the Creative Youth Association, demonstrated a query-list-update system operating in a MULTIFMS environment. It may seem less interesting, but when developing the system the authors kept in view a factor still very little honored today--the system works with a Hungarian language instruction set. Its messages, explanations and guides are all in the Hungarian language. And if one asks it to order a selected data file it can do so in Hungarian alphabetical order. The program package can be used on the most varied minicomputers (SZM-4, TPA-1140, -48, etc.).

The "finite element program package" described by Karoly Varadi serves to dimension various structural elements; with its aid one can model studies on statics, thermal conductivity, etc. in the event of various load conditions. It is also possible to study several load cases at the same time.

This same block included a talk by Andrej Trentowski, of the Polish ZETO-ZOWAR, a talk awaited with great interest but which got lost due to difficulties of translation, on the SAGO applications system generator, which works with the CP/M 2.2 and MP/M operating systems; the other theme dealt with was a fire fighter's alarm-control system in which lively Hungarian interest was shown.

The talk by Tamas Gati (Agszircoop) dealt with the systems development experiences and ideas of his enterprise. He said that they were working on a number of their own machines and on machines owned by the SZUV [Computer Technology and Management Organization Enterprise]. They want to use all sorts of machines, from large computers to microcomputers. In order to realize this goal they are trying to develop flexible, modular, easily handled model systems. They are operating six computers, operational reliability of the machines is between 70 and 100 percent, but they had one machine which had an operational reliability of 30 percent for the year. Their plans also include organizing education. Naturally this does not mean that they want to compete with the SZAMALK. They want to operate in areas such as teaching basic computer operation. As was said in a comment on this talk the training of professional users is not considered satisfactory, although this influences the spread of computer culture to a significant degree. Another comment recommended commercial sale of organizational solutions.

Rumen Sztojanov, a main department chief, talked about the computer trade plans of the SZAMALK. He said that they were planning to import several SZM-1420 machines during 1986. They also plan to import the SZM-5303 and SZM 5309 fast magnetic tape units in the same year. The peripherals import plans include Winchester disks of a capacity satisfying various user needs. The capacity limit of the latter is set by limits on the vendors. They also plan to import VT-100 compatible terminals and IBM PC level microcomputers, attaching them to the SZM-1420.

Nikifor Mihajlov, leader of the OSAK, talked about those areas where the supply of software products makes it possible for computer technology culture to be used in an ever wider circle. The two chief areas where the OSAK intends to contribute significantly to the software supply are network software and software portability.

In connection with the C-64 computers the position of the OSAK coincides fully with the position long voiced (unfortunately, still in vain) by the professional computer technology public opinion of the country, namely that these machines, although outstandingly suitable for arousing interest in computers, are not suitable for professional purposes or for solving extensive technical-economic tasks. However, their existence and widespread use are facts. Since they represent a significant forint value the OSAK has taken cognizance of this and must help to put these machines into systems; the spread of network software serves this purpose. One can (and must) debate whether under present investment conditions one should keep the "Commodore syndrome" alive, but one must make the existing stock of machines as useable as possible.

The creation of new software products is also an investment question. The question continues to be whether the software product to be created is really "new". Several decades of large computer software development have created things of lasting value. One should investigate whether these software products can be transferred to minicomputers with relatively little expenditure; the transferability is obvious for those products which were prepared in high level languages. To make this transfer possible the OSAK is planning to acquire, among other things, a PL/1 translator which can be run on SZM-4, TPA-1140, etc. minicomputers which corresponds to the OS G level PL/1 translator developed by an American firm.

Concerning the role of the OSAK on the software market he said that it wants to ensure mutually advantageous trade with the socialist countries. Software import will continue to play an important role, but the OSAK is striving to see that export has more importance too. It regards as a basic principle a harmonization of import-export prices in accordance with the "Bucharest price principle."

The series of lectures on the first day was closed by Steve Gothard, representing the QUEST firm which also had an exhibit at the meeting, who talked about how they want to expand their already existing market in the socialist countries through cooperation with SZAMALK.

"Roundtable"

Unfortunately the discussion did not deal adequately with all the problems. The most was said about the phenomenon called the "Commodore syndrome." Nikifor Mihajlov said that the effort in Hungary at the moment is to help put the Commodores into a system, which unfortunately leads to some very eclectic systems. It would be desirable if the machines of a system were units coming from one manufacturer. Tamas Szekely (OSAK) said that unfortunately it is very difficult to put together a cheap system, since there is no profit in cheap machines.

The other theme coming up at the roundtable was the question of education touched on by the speaker from Agszircoop. Adam Kis, chief of the education department of the SZAMALK, said that necessary foundations should be provided for training both expert levels (user and developer). Like Tamas Gati, Eva Blitzer deplored the lack of training for "lowest level" experts. According to her there is no material background for giving machine oriented training, although in the event of solvent demand this could be done.

The UNIX block had a place in the second day's program. The Commodore themes figured here also. But the second day did not end without lessons either. One theme was a description of the material movement systems and program packages serving to design equipment, developed at the NME in Miskolc and based on the Commodore. The development took place at the request of the OMFB [National Technical Development Committee] and it was done on the Commodore because they had no other computers then.

A similarly interesting theme was "Solving Dimensional Chains With a Computer" described by Dr Csaba Kosaras for the designing of structures.

Unfortunately the series of lectures included some which should have been given at a professional seminar and not a meeting to exchange experiences. There was something missing at the meeting, and according to the organizers they intend to change this so that in the future exhibits will illustrate the themes reported on.

Summing up it can be said that the meeting reflected well the minicomputer (and partly the microcomputer) situation in Hungary and the position of the experts in connection with this situation, and it satisfactorily outlined the possibilities for solving the problems.

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PROBLEMS IN INCREASING STORE OF ES 1022 COMPUTERS

Budapest SZAMITASTECHNIKA in Hungarian No 1, Jan 86 p 7

[Article by Karoly Cseh and Janos Mahler, Csepel Works SZTV: "Experiences in Store Expansion of ES 1022 Computers"]

[Text] Two ES 1022 computers (factory numbers 132 and 133) were put in operation at the Computer Technology Enterprise (SZVT) of the Csepel Works at the end of 1978. Both central units were delivered with 512 K bytes of ferrite memory.

After they were placed into operation the following, substantial problems appeared with the memories: contact faults at the connectors of the circuit sheets, uncertainties on the circuit sheets themselves (cold soldering, uncertain connection of potentiometers), cold soldering found at the terminals of the ferrite memory matrix lacing and cold soldering on the circuit sheets which was very difficult to measure and then perfectly resolder because of the lacquering.

Eliminating the contact faults at the connectors of the circuit sheets required a long time and much observation. The chief reason for this was that there was no deposit on the edges of the sheets in the case of the connectors of the circuit sheets and so shoving the sheets all the way in--until they hit--made contact from both sides uncertain.

Real and steadily appearing memory errors had to be remedied with repeated soldering at the terminals of the above mentioned ferrite matrix stringing on five occasions for our "A" machine and on three for our "B" machine.

The uncertainty of the ferrite store, described above, prompted us to seek a solution by using the semiconductor stores appearing on the market. By expanding the semiconductor store we could simultaneously increase the memory access of the ES 1022 computers to a 1 M byte addressable range. This was also an extraordinarily essential factor because of the operational memory capacity needs appearing when using remote processing monitors.

In the interest of solving the problems listed above we sought the variant which was most favorable for us and also most reliable out of the broad scale of offerings to be found on the market. We were not indifferent to the price, the number of reliability references or the expected time to carry out the reconstruction.

The most favorable bids came from NIM LABOR and the Datacoop Cooperative; showing suitable reference cites they offered stores of various size. (Every firm offered semiconductor stores!)

In addition to these bids a number sought us out from other firms and small undertakings, but they could give no references. There was even a bid where we would have to import the integrated circuits from abroad and the bidder would provide only the printed circuit sheets, frames and other necessary items.

Finally we accepted the bid of the Datacoop Cooperative for our "A" machine--where the appearance of memory errors was much more frequent before the reconstruction. Our decision was justified by the following: they would build a 1 M byte store into an existing empty space in the cabinet of the central unit; there was no need to produce a separate feed voltage because they used the voltages of the power units previously used; they could provide a suitable number of reference cites which gave a good opinion; and the price offered by them was favorable for us too.

They put it into operation in our machine extraordinarily quickly--during one shift--including the changes on the control console and in the central unit.

We have had no problems with the new 1 M byte store in the more than 3 years since it was put into operation; there have been no failures.

The figures show the occurrence of memory errors in both machines beginning with when they were put into operation.

Since we dismantled the two 256 K byte ferrite store cabinets from the "A" machine it was possible for us to put the most reliable circuit sheets, those giving the best contact, into the 512 K byte store operating in the "B" machine. So we were able to reduce the occurrence of memory errors in our "B" machine also, although we could not completely eliminate them.

In 1984 we held talks with NIM LABOR as a result of which they undertook to fit an OL 630 via an adapter to the existing 512 K byte ferrite store of the "B" machine, thus exapnding it by 512 K bytes. Together with the memory expansion, naturally, they did the reconstruction of the central unit and the recabling work. With this expansion by 512 K bytes our "B" machine also has 1 M bytes of memory.

During the more than 1 year which has elapsed we could gather experience that a mixed memory structure is also possible, and it does not hurt operational reliability. As with the "A" machine we have had no problem with the 512 K byte expansion connected to the "B" machine; in every case the memory errors appearing derived from a failure of or the unreliability of the original factory ferrite store.

Summing up the memory expansions done on both machines it can be established that the reliability of semiconductor stores is much better than the ferrite based ones shipped with the ES 1022.

Software problems did not appear in connection with the memory expansion. With the expansion the earlier useable area of about 300 K bytes was increased to 700 K bytes.

This capacity increase made it possible to keep certain system programs (reader, writer) permanently in memory. We could provide a larger memory area for our remote processing system, thus substantially reducing the run-through time of remote data processing transactions.

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OFFICIAL INTERVIEWED ON COMPUTER APPLICATIONS IN AGRICULTURE

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[Interview with Dr Miklos Villanyi, state secretary for agriculture, by Dr I. Sz.]

[Text] In recent years our journal has stressed the task of following the development of the use of computer technology in domestic agriculture and the food industry. In connection with the program "Forum '85, Computer Technology and Informatics in Agriculture" we asked the state secretary how he saw the situation of agriculture and how modern the computers and information were in this sphere of the economy which was of key importance even in the past, a position it does not want to lose in the future. We know that it is impossible in a single interview to give a full review of agricultural and enterprise information systems, of the status of computer technology applications in agriculture. But certainly a few important ideas can be formulated, and these will update, supplement and make more precise the picture which our journal has presented to the professional reading public thus far.

[Question] Have the methods and tools of production and enterprise guidance been able to keep up with the changes in the expenditure structure of agricultural producers and in the size, organization, guidance and economic level of the operations and with the appearance of the most modern production technologies and materials in some of the branches?

[Answer] The broad use of electronics in economic, social and scientific processes is one of the determining characteristics of technical progress in our age and this appears in the broad use of tools operating on the electronic principle and of methods based on these tools. Electronic solutions must contribute to increasing the efficiency of the processes.

So they must play a role especially in developing solutions which conserve energy, material, investment, stockpiles and manpower, in satisfying the ever increasing need for information, in increasing assets efficiency, in improving the competitiveness of production activity and in rationalizing intellectual and physical labor.

An ever more serious obstacle to a swifter development of our production and management is that we have not provided the optimal organizational and management conditions for optimal utilization of our very valuable fixed assets (machines, tractors, trucks, combines), for use of the 60 billion forints' worth of fodder which makes up a large part of the costs, for use of the 10 billion forints' worth of artificial fertilizer, for consumption of fuel also worth 10 billion forints or for use of machine parts of a significance of the same order of magnitude. These are the areas in which conservation has the greatest importance. Leadership and guidance of the specializing and concentrating large scale production and a swifter accomodation to market conditions require information on a broader scale than heretofore, swift and good decision preparation and many-sided analysis.

Our further development demands ever more urgently a faster raising of the level of production guidance and enterprise management. We must concentrate increasingly on making performance accounting and stockpile control more precise and on the economicalness of material, feed supplement and fuel use. The use of modern computer technology is indispensable in this process.

The use of electronics in our country is at a substantially lower level than the developmental level of the people's economy. If we study the structure of the use of electronics by countries more developed than we and the volume of electronics use in industrial and agricultural production, in health affairs and education, then we can establish that we must increase several times the quantity of electronic tools used in order to maintain our level of relative development, not even to speak of the fact that all this is only a quantitative change in itself--realizing effective use poses increased requirements in training, research and enterprise practices alike.

Under present production and management conditions the need for modern information is obvious. Obtaining, recording and processing the necessary data and performing the various analyses and calculations are possible only in a well thought out information system and on the basis of modern technology.

The majority of the first computer applications did not bring a qualitative change in information. Our data processing usually stopped at performing various listings and totalings and did not perform the most important tasks, calculating favorable variations and serving enterprise leadership.

Effective enterprise use of computer technology was given a real boost by the subprogram titled "Agricultural and Food Industry Computerized Model Systems" of the National Medium-Range Research and Development Plan in the Sixth 5-Year Plan period.

[Question] What were the achievements of the subprogram?

[Answer] The increase in enterprise size is accompanied by a swelling of management tasks and an improvement in the quality and operational character of accounting calculations. The high quality mechanization of these tasks is

aided by the "enterprise guidance and accounting system" developed and successfully used by the Fejer County TESZOV for a VT-20 computer and by the Bekescsaba and Environs Agricultural Association and the Babolna Agricultural Combine for an ESZ 1035 computer.

Production guidance tasks (site guidance, fodder management, capacity planning, etc.) also require computerized solutions. Feeding optimization, animal site guidance, mechanization organization and feed mixing technology guidance programs developed by the BAGE as part of the central program are in successful operation.

The planning system of the BAGE is also used by numerous farms in the interest of improving enterprise planning. A significant number of the program systems prepared were prepared in a standard version, that is they can be used in a broad user circle with little modification--at a low cost. The MEM [Ministry of Agriculture and Food], the KSH [Central Statistics Office] and the OMFB [National Technical Development Committee] jointly undertook partial financing of the themes, in addition to which the enterprises also contributed significant financial resources to the centrally coordinated developments. In addition to the central initiatives, the most varied record keeping and accounting programs and programs optimizing management of production factors were worked out and introduced by numerous enterprises for equipment of various sizes--in many cases with parallel cost expenditures. In both agriculture and the food industry management applications are in first place among the applications areas, representing 32 percent of all applications. Auxiliary operation applications (way-bills, fuel, energy) represent a significant applications area in the agricultural operations, representing 19 percent of all agricultural applications. The crop production and animal raising applications (feed mix optimization, propagation biology, hog and cattle site guidance) make up 14 percent each. In many cases the independent developments did not bring the expected results. Effective development and application requires the joint work of experts who understand computer technology and enterprise production organization, business organization and enterprise guidance.

[Question] Did the computer technology tools with which they are now working perform their tasks effectively and in a satisfactory way? Did their size meet the real organizational and task solution needs?

[Answer] I must say that unfortunately they did not, at least not perfectly, because, for example, the effective agricultural enterprise use of computer technology also requires machines of a suitable size. For example, numerous negative phenomena accompany the process whereby they acquired more and more personal computers last year, primarily out of business considerations, computers which do not have or have only in part the necessary background capacity and software, the ability to be used in the many ways serving operational needs.

The lack of low priced computers suitable for the enterprises has held back the use of the systems which have been prepared. It is an unfavorable phenomenon that many different types of machines got into agriculture in past years. There are about 100 different types in the area; 38 percent of the computers in the area of the ministry, about 350 computers, are operating in the producer cooperatives and 13 percent, about 110 computers, are operating in the state farms.

About 90 percent of the machines belong in the personal and hobby micro category. These have only smaller central memory, most are single user computers, their background capacity is limited from the viewpoint of data storage, and they put limits on processing.

[Question] What are the other tools available in the ministry's area, and how successful is their use?

[Answer] About 60 state farms, 260 agricultural producer cooperatives, 100 food industry enterprises and 130 other institutions have some sort of computer technology equipment. In contrast to this, there is no computer in more than 60 state farms, 1,000 producer cooperatives, nearly 100 food industry enterprises and 130 other institutions!

The gross value of the computers of the ministry including peripherals exceeds one billion forints, of which the gross value of mini-micro-presonal computers is 372 million forints. The net value of all stock is 654 million forints.

Putting this large number of computers into operation did not bring the desired results. A significant number of the computers do not meet the requirements either in size or in technical design or in reliability or in basic software supply.

The many machine types and the very different sizes and configurations caused and are causing serious difficulties in adapting the programs and systems which have been prepared and are hindering the broad use of the achievements and their cost effective take-over from the developmental bases.

Going beyond the technical and program supply conditions it is an important condition for the use of computer technology that suitable computer technology preparation be given to the college trained production and economics experts working on the farms. As for the present situation we cannot say in this regard that instruction has gotten ahead of practice in computer technology applications; here also we are only laying the foundations and with one or two exceptions there is a general lack of instruction giving a modern systems view, laying the foundations for effective enterprise use of a computer and teaching modern applications information.

[Question] One can sense from what has been said that much remains to be done. What are the goals from the realization of which you expect an elimination of the outlined backwardness?

[Answer] It can be regarded as a general goal that future developments should be built on the results already achieved and that the same point of view be realized at the levels of enterprise management, special administration and central guidance, namely that priority in the developments be given to applications which directly or indirectly aid production, productivity and economic efficiency.

If we look at our share in the people's economy, our modern large operations and developed production technologies then our computer technology applications are far from what is desired. If we cannot move forward more quickly in this area this could be a serious obstacle to the further development of our production and management.

It is our practice that computers are used first primarily at central organs, in guidance, and today we have significant databases, data processing systems and decision aiding methods at the central organs. The available data, arranged in time and operational order, provide good help in working out the regulators.

In the areas of special administration and research computer technology has ever greater significance in improvement by breeding, in managing the producing capacity of the soil, in registering breeding stock, in guidance, in working out and evaluating the central regulators and in preparing decisions. There are today few investment sources for realizing the goals, so good use of them is even more important. The saying is well known, "Measure three times, then cut!" So good preparation of decisions is crucial, then they can be finalized.

Creating an information base for the production organization and enterprise leadership of the producing operations and creating the technical and human conditions for this are crucial questions for us in the present situation.

With our present large operation conditions there are very many agricultural operations organized on the basis of the same principles which have similar production-biological factors, work out their plans in the same way and use the same record keeping and reporting system.

Modern enterprise management today requires fast adjustment to market needs and conserving management of material, stockpiles and wages. (Today this is the order of magnitude and not the order of importance.) The agricultural officials see the chief advantages of computer technology primarily in the fact that computer technology makes possible the solution of tasks which could not be solved with the classic decision making methods. This applies first of all to optimization of feeding, use of artificial fertilizer and transportation, to calculating the optimal structure of production, to direct operational decisions, to analyses and to operational production guidance.

In the Seventh 5-Year Plan we must turn the material and intellectual resources available to us to reducing the backwardness appearing in applications, to developing further the achievements of the Sixth 5-Year Plan, and to developing comprehensive applications systems. Developments must be urged primarily at the producing and managing enterprises and this must be aided centrally.

It is now clear that a modern information system and technical base can be created only if there are available for the machines those modern and easily managed program packages which provide the experts with information which can be used directly. The preparation of software must be stabilized in the future; that is, we must work out a uniform program system for the chief computer types which will include:

--development of microcomputer enterprise management program packages which satisfy operational leadership information needs at the level of production units (technological plans and operational tracking of their realization, transportation organization, capacity scheduling, etc.), which provide planning and analytical data in various time frames at the operation or enterprise level, and which optimize management of resources (material, assets, manpower);

--process control of plowland crop production, which extends to the introduction of automation in the production process for crops produced and to computerized modeling of recording and analysis of the ecological and economic factors influencing the effectiveness of the process;

--guidance of the animal raising process, which extends to production organization of breeding, propagation, fattening and slaughter and to the information areas of raising, feeding and animal health.

[Question] It appears to an outsider that taking over the solutions already proven and working out standard solutions may have very great significance in agriculture. Knowing about current research and achievements and forcing individualizing applications developments into the background would result in gigantic cost and time savings. How does the state secretary see this problem?

[Answer] In addition to the importance of working out standard programs adaptation also has great significance, naturally. This is not only a technical task. We must get the leaders and workers to accept that the machine provides more precise information not only for the leadership but also for those doing the operational work. It is a fundamental condition for the fast spread of results that the enterprise and branch leaders demand and accept with trust computer technology in their areas and take over each other's achievements.

A series of various ideas have been worked out in past years. In the course of this it turned out that professional microcomputers with several work stations, large background stores and reliable peripherals were suitable for the size of agricultural operations and could solve their computer technology tasks in the future. But we cannot give up the capacity of the large computers already operating and used by the agricultural and food industry enterprises

either. For example, agricultural enterprises today account for 5 percent of the receipts of the SZUV [Computer Technology and Management Organization Enterprise] network while food industry enterprises account for 10 percent. Even while the professional microcomputers come to the fore the large computer network can continue to play a significant role in data processing for the food industry enterprises and trading organizations, and the well prepared experts available here can also undertake a greater role in preparing programs and program systems for the users of professional microcomputers.

[Question] How do you intend to influence and ensure the use of suitable computer types preferable from the viewpoint of task solution?

[Answer] Even in past years we made great efforts in the interest of improving hardware supply--using the central dollar allotment--to provide domestically made equipment of suitable size for agricultural operations at an appropriate price, equipped with capitalist peripherals, and to provide complete capitalist import equipment. As a result of our efforts, for example, the Proper-16/W type equipment can be purchased for our operations. In 1985 we succeeded in supplying our larger enterprises with the significantly large Alpha MICRO type computers. In addition to these the MUSZI [Agricultural Business Organization Office] is selling for operational applications the MXT, the GDR Robotron and the Videoton computers, which make possible the analyses connected with bookkeeping and production guidance.

So in the Seventh 5-Year Plan it is realistic to expect massive enterprise use of microcomputers. The guiding organs, providing enterprises and farms must prepare for this.

Our chief problem in connection with the mass use of professional microcomputers is the lack of suitable standard user programs. So we must concentrate our efforts on production of user programs, and in the course of this on modernizing the enterprise information system and on getting this accepted.

In addition to the hardware and software conditions progress depends fundamentally on improving personnel conditions and incentive. Development of enterprise information systems and applications software requires the maintenance of constant contact between computer experts, methodological experts preparing econometric models and agricultural experts using them.

[Question] Does this mean that in the future more care will be taken of training tasks too?

[Answer] I think, and it is my experience, that appropriate use of computers is possible only with an end-use orientation. But it is a condition for this that our agricultural experts get closer to the computer. Only in this way can we prepare the so-called "end-use-oriented" programs, if we precisely formulate the needs of the profession. So it is an important task for the universities to prepare the graduating engineers for real life; that is, they should know the tasks which can be solved on the microcomputers working in large numbers in the operations and they should become experts who use computer technology with understanding. In the interest of realizing correct

training goals there should be computer technology laboratories in our educational institutions and the technical equipment of these should represent the equipment operating in large numbers in the plants. There must be a greater effort to produce software on the available technology which can be used well in operational practice. Our educational institutions might also undertake a greater role in the development of applications software. It is a general experience that professionally well founded systems development strategic plans are indispensable for successful enterprise use of computer technology.

[Question] What is your opinion about the significance of a broader discussion of the strategic plans of the ministry and, in this sense, of the tasks, significance and responsibility of providing information?

[Answer] In the future, much greater emphasis must be placed on the forms and general intelligibility of communicating computer achievements. Making applications achievements public, spreading user software, and advertising the practical utility of it demand absolute correctness! In addition to the specialized press the responsibility of the daily press is very great also, but especially great is the responsibility of official experts providing information. Taking these factors into consideration also, I might say that, in the interest of a swifter future further development of enterprise use of computer technology and informatics, we must also go further in the area of central regulation and rational coordination and influence.

In the plan period the MEM will initiate realization of a complex development program and will urge the broad spread of it. We intend to realize the program by bringing in a number of undertakings, in a competition system. The competition system must make possible the development of healthy competition among entrepreneurs, which could result in the more effective use of significant state investments. There must be broader debate. Development and user experts must be given the opportunity for a broad analysis of the situation, they must work out proposals for good solutions as soon as possible.

It is especially important that the generation, the expert staff, which has now started or is now starting into production should feel, consider important and recognize the tasks to be solved in this area. They should be aware that their production, enterprise and personal successes also are interdependent with the creation of a modern information system, with the effective use of computers.

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COMPUTER DEVELOPMENT, APPLICATION IN CSSR

One-Chip Computers Developed

Prague TECHNICKY TYDENIK in Czech No 5, 28 Jan 86 p 2

[Article by "(cho)": "Development of One-Chip Microcomputers Completed"]

[Text] The final opponency proceedings on the State R&D Plan's priority project "System of One-Chip Microcomputers" were held in Prague on 12 December. The three organizations of our electrotechnical industry collaborating on this project were: the Tesla A.S. Popov Communications Research Institute; Tesla, Piestany; and the Tesla Eltos [Electronic Circuits and Components] Institute of Microelectronic Applications. The project's planning and design problem called for the design, development and verification of 8-bit one-chip microcomputers, types 8048 (with ROM on the chip), 8035 (without ROM on the chip) and 8748 (with EPROM on the chip), and of circuit 8243 (input-output expander). It was also necessary to develop and produce memories of types 2114 (static RAM organized as 1K x 4 bits), 2716 (EPROM organized as 2K x 8 bits), 6561 (static RAM organized as 256 x 4 bits) and 8155H (static RAM organized as 256 x 8 bits + expander), and also development aids TEMS 48 (educational and laboratory microcomputer) and TEMS 49 (emulator). At the same time, suitable conditions had to be created for the applications of the one-chip microcomputers, by developing software and standard applications for them, and designing and introducing a system for the training of their users. All these tasks have been fulfilled successfully on or ahead of schedule, and some components and systems have been developed in excess of the plan.

At a press conference held the same day on Novodvorska Street in Prague, members of the R&D team acquainted reporters with the purpose of the project: to give the national economy a versatile integrated circuit for industrial and other applications. As could be seen from the exhibited first applications, a complete microcomputer occupying an area 5.5 x 5.5 mm^2 [as published] is able to control the operation of, e.g., a record player, tape recorder, household switching center, car computer, etc. Most of the developed components are already being produced by Tesla; the development aids from the Tesla Institute of Microelectronic Applications are being produced at Tesla, Liberec. Noteworthy is the high economic efficiency of the solved project: every invested koruna gives a return of 2.83 korunas, and our society will recover the investment cost in 2.5 years.

At the Tesla A.S. Popov Communications Research Institute, preparations are already underway to develop even more advanced 8-bit microcomputers (types 8051, respectively 8751, and 8031) that will have more memory capacity and greater arithmetic capability. Furthermore, new types of memories that will employ NMOS and CMOS technologies. The development and wider use of custom and semi-custom chips are also expected. Simultaneously, the task is being solved of increasing the reliability of our component-producing base (which ties in also with the size of the produced series), as well as the task of increasing the mechanical and climatic resistance of some of our components to make them suitable for applications in the automotive industry, for example.

And when will the one-chip microcomputers find application in consumer products? The pricing of the components should not be an obstacle, because it is essentially in line with the world-market prices. The point at present is to master the demanding technological preparations for production and to secure suppliers. According to information provided by the R&D team, Chronotechna in Stemberk is expected to produce as of 1987 a timer for investment and noninvestment applications; it will be possible to set the timer accurately within 1 minute, and it will keep exact time with a permissible departure of plus or minus 5 minutes a year. PAL [Automotive and Aircraft Instrument and Accessory Industry], Kbely, has undertaken to manufacture a car computer (it will give the driver information on the momentary and total fuel consumption, the average hourly speed, and the trip distance and time); production is expected to begin in 1987. Tesla, Prelouc, is to produce as of 1988 a tape recorder whose basic functions will be controlled electronically. Tesla, Litovel, is to produce a record player of this type as of 1987.

The one-chip microcomputers are suitable for a wide range of applications in our industry, transportation, agriculture, etc. The training center of the Tesla Institute of Microelectronic Applications in Pardubice is offering courses for anyone interested in the hardware and software of the MHB 8048 microcomputer (and of the other devices operating with it). Textbooks, educational computers and other aids are available at the center.

Application of Personal Computers

Prague TECHNICKY TYDENIK in Czech No 10, 4 Mar 86 pp 1, 6

[Article by Engineer Vladimir Hojka, director general of the Automation and Computer Technology Works Concern, Prague: "Personal Computers in the National Economy"]

[Text] A new class of computers, so-called personal computers, appeared on the world market in the late 1970's. This has been made possible particularly by the development and production of new components in the electronics industry, using LSI technology. The following data confirm the rapid growth of personal computers in the industrially developed countries: the average annual growth rate of the output of personal computers in the United States in the period from 1980 through 1984 reached 52 percent in terms of the number of units produced, and 45 percent in dollar volume; the output in 1984 was 2.7 million personal computers worth 4.88 billion dollars; the average price of a personal computer is about 1,800 dollars. The socialist countries, too, are devoting considerable attention to the rapid growth of personal computers.

The personal computer has proved itself as a progressive element in the set of technical devices for the application of electronics in the national economy, and the necessary conditions for its effective use are being created in our country as well. The demand for computer technology as an effective tool of research and development is growing rapidly. At the same time, the requirements regarding its quality, reliability, operating characteristics, performance parameters and software are also increasing. We at the Automation and Computer Technology Works (ZAVT) Concern are adopting concrete measures in this direction. We have begun the development of a modular system that fully meets the users' requirements for a modern personal computer and also permits modifications for various dedicated applications. For this system it will be necessary to produce also the peripherals that meet the specific requirements for the peripherals of personal computers.

System of Small Electronic Computers

Until about 10 years ago, the development of microcomputer systems in the individual CEMA countries proceeded without any coordination. This led to the production of systems that were not mutually compatible, which in its turn reduced their effectiveness from the users' point of view.

At the 12th session of the Intergovermental Commission for Computer Technology held in 1974, therefore, it was decided to develop a unified System of Small Electronic Computers (SMEP). The Automation and Computer Technology Works Concern, Prague, was assigned responsibility for the tasks of this program in Czechoslovakia; and the concern designated the Computer Technology Research Institute (VUVT), Zilina, as its main managing and coordinating center.

In 1981, after only the first two years of its existence, the Computer Technology Research Institute, Zilina, developed two modern minicomputer systems, the SM 3-20 and SM 4-20, able to fulfill the demanding tasks in controlling technological processes, and configuring computerized management systems for agriculture, services and education. Two hundred SM 3-20 systems and six hundred SM 4-20 systems have been built so far. On the basis of international cooperation with the CEMA countries and the Soviet Union in particular, this institute alone has designed and developed nearly 60 items of hardware and software. The most significant items among them are: the powerful SM 52/11 minicomputer, the 50/50-1 microcomputer system, the SM 53/10 distributed multiuser system, the MSV 80 microcomputer program-development system, a simple CRT terminal, a graphics terminal, a vector graphics terminal, and an external memory based on the MPP 45 magnetic tape memory.

As a part of the tasks under the SMEP III program, the following have been designed: the SM 52/12, a powerful 32-bit minicomputer with up to 8 MB of main memory; the SM 52/11, a powerful 61-bit minicomputer with up to 4 MB of main memory; also a series of small computers such as the PP 01 and PP 04 personal computers, and the Text 01 and Text 02 word processors.

Toward the Conditions of Widespread Installation

All the personal computers built in our country can be connected to local computer networks. The implementation of such networks, without regard for their

topology, is a prerequisite for the truly efficient installation and operation of personal computers. Another prerequisite is the establishment of an extensive library of solved tasks in all the technical, scientific and social fields, including the computerized management information systems within public administration. A precondition for the use of such an extensive library, aside from its very existence, is also the editing of the programs according to a standard form, with provisions for their testing, filing and distribution. The operating systems must be compatible with the most diverse foreign operating systems for personal computers and must be able to run the programs written for mainframes. A no less important requirement for personal computers is that they must be able to operate as remote terminals of other, larger computers.

The widespread installation and more intensive use of personal computers will open new communications channels, and so-called electronic mail will intesify the flow of information. This will affect the operation and activity of every organization, regardless of its affiliation. As a result, for example, the structure of the enterprise will change, and so will the forms and practices of contact within the enterprise and the business dealings between enterprises. This influence ties in with a much broader problem: the social and organizational effects of using computers.

The man-machine relationship is undergoing an evolution determined primarily by the technological advances in this field. A person who uses a computer is no longer a computer operator, but becomes a computer user who has direct access to the computer through its efficient software. Coordination of the activities of man working with a computer is a problem common to all computerized systems. It essentially reflects the trend toward bringing the computer's external manifestation closer to man's dimensions, so that the computer system and applications software may become efficient tools in the hands of man, the computer user. The computer user, unlike in the past, will not be required to know computer science. Up to now, control and computer technology has been entrusted to specialists trained for that purpose. With the introduction of personal computers in everyday practice, the official using such a computer will be able to work with this technology directly, without go-betweens. Computer specialists will be providing service in the widest sense. In other words, they will install the equipment, maintain it in operating condition, expand the systems, write software, etc.

Back in the early 1970's, analog and digital computers with capacities of the order of kilobytes were still competing with one another in computer applications, and every organization strived to have a large mainframe of its own that could handle simultaneously the most diverse activities of the organization. But today mini- and microcomputers are finding ever wider application in this sphere as well.

Local Area Networks

The advances in microelectronics make it possible to gradually equip the individual workplaces with microprogrammable automatic devices. However, a certain mutual isolation of such devices is a drawback and an obstacle to their efficient utilization. Although they can be interconnected by conventional data

communications techniques and designed as terminal or computer networks, this is not always economical. When most of the requirements for data communication between terminals, computer devices and data phases are merely of a local nature, it is more economical to use technically more simple communications devices that are adequate for this purpose.

Therefore, a further condition for the truly efficient use of small computers in the national economy is the installation of local data-communications network technology, known in the literature as LANs (local area networks). A LAN is a network that permits digital data communications between the interconnected terminals and computers that are located on a limited area (of the order of kilometers or tens of kilometers) and are used by the same organization or the same group of organizations. On the basis of their applications, these networks may be divided roughly into process control LANs, and management information LANs. The widespread use of such networks in the national economy is being hampered, among other things, by a shortage of devices suitable for interconnection, and by the still inadequate communications software. This is due in part to a certain dissipation of microcomputer production in our country, and also to the persisting shortage of fast LSI circuits. The application of electronics in the national economy cannot dispense with two-way data communication between microelectronic devices. The development of devices for the System of Small Electronic Computers is heading likewise in this direction: i.e., toward the establishment of local area networks with personal or microcomputers.

On the scale of the national economy, the use of computer technology in general, and of personal computers in particular, is essentially still in its infancy in our country. The development of this technology is governed by society's dynamic needs on the one hand, but on the other hand the realization of the actual technical potential is still continuing.

The technical aspect is still the dominant one so far. However, the problems that the production and especially the use of computer technology raise are primarily organizational and socioeconomic problems, rather than merely or mainly technical ones. Therefore, the manufacturers in the CEMA countries, and hence in Czechoslovakia as well, will have to respond faster to the users' quantitative and qualitative demand, and to produce in accordance with society's qualified imperative. But successful application of computer technology will be possible only if the problem of educating and training computer users is solved, and if the enterprises expand and comprehensively organize their services.

Data and information processing will have to be developed in future as a separate branch of the economy, on the basis of economic integration and with due consideration for the division of labor within CEMA.

Computer System in Metallurgical Plant

Prague TECHNICKY TYDENIK in Czech No 12, 18 Mar 86 p 6

[Article by "(ma)": "Modern Energy Management"]

[Text] The hardware of the computerized control system that is being implemented gradually at the Klement Gottwald New Metallurgical Works (NHKG) is

based on a pair of interconnected central computers, with a network of roughly 100 CRT and typewriter terminals, and also extensive data bases stored in the central computers' external memories. This permits very efficient and timely information processing from files, control of continuous metallurgical production (especially of the finished output from the rolling mills and pipe mills), production-related energy management, and management of railroad transportation and sales, including the invoicing and shipping of finished products.

However, practice has also confirmed that it is warranted to install smaller computing units, more flexible and better adapted to the users' needs. These units partly constitute a computer network with the central computers. But often they work autonomously or only transfer summary information to the central computers, on some machine-readable medium.

Understandably, the wider use of such units depends also on the development of mini- and microcomputer production in Czechoslovakia and the other CEMA countries. Computers of the SMEP [System of Small Electronic Computers] series, especially computers SM 4-20 and SM 52-11, are being installed gradually in engineering plants.

In addition to the two autonomous subsystems for managing 20 forms of energy, lately also intelligent terminals M3T 300 and M3T 320, supplied by Matra of Blansko, have proven suitable in practice for energy management at the Klement Gottwald New Metallurgical Works.

Model M3T 300, equipped with a built-in floppy-disk drive and a Consul 211 dot matrix printer, has been in use already two years in operating the NHKG power plant's electrical equipment. The electrical equipment's data base resides in this model's external memories, where it can be updated continually. The data base contains the manufacturer's certificate, operating instructions and service manual for every primary and secondary substation at the enterprise, together with the detailed specifications for the individual parts of the electrical equipment. When a fault occurs, the maintenance workers are able to obtain a detailed printout of the equipment that is being repaired, together with a list of all the parts and subassemblies. As a logical consequence, there are fewer faults. Or more accurately, the faults and breakdowns are repaired quickly, because the maintenance workers are better informed and prepared, and can have the necessary replacement parts and subassemblies at hand.

Another task for the terminal is to prepare single-line diagrams of the high-voltage substations. Earlier these diagrams were drawn on the basis of painstakingly compiled updates every five years, and each substation required six or seven sheets of A4 [210 x 297 mm] size. Now it is sufficient to enter on the terminal's keyboard the data identifying the substation, and the terminal automatically prints out the accurate and--most importantly--updated information reflecting the latest actual situation. This also saves the considerable amount of time that the designers and draftsmen had to spend on the periodic redrawing of the substantions' diagrams. Moreover, the routine changes and systematic updates in the substations' data file also are made in this manner.

For the maintenance needs of the substations, periodic inspection schedules are prepared, at agreed regular intervals. These schedules are printed out in

a breakdown by the individual units of equipment and by the technicians who do the inspections. On the basis of the data from the protocols on the completed inspections, the technicians then update the file on the floppy disk. At the same time, this practice relieves the inspecting technicians of having to prepare the inspection schedules manually, and it also provides information for their specific activity, promptly and for a minimal input of labor.

The newer terminal model, the M3T 320, is being used for the second application that is now being implemented at the power plant. It serves as the base of the mobile measuring and evaluation system that is mounted on an Avia A31 panel truck. The system is equipped with a unit for contact with the environment, through which it connects to the sensors and transducers built into the measured set.

The measured data are transmitted over cable to the terminal's central unit that is able to compute the parameters describing the investigated equipment's mode of operation. With the help of the data obtained from an analysis of the measured values, it is then possible to tighten the technical and economic norms of energy consumption, and also to comprehensively evaluate the technological process from the viewpoint of energy consumption. This permits direct changes in the technological conditions, and the formulation of appropriate measures for the general overhaul, modernization or reconstruction of the equipment in question.

It is planned to use the mobile measuring and evaluation system also on the hot-blast stoves of the blast furnaces, for example. Here the use of a higher proportion of blast-furnace gas to replace coke-oven gas will save an estimated 35 TJ/year. Other expected applications include the optimization of the thermal conditions in the reheating and melting furnaces, and in the technological units in the power plant itself--i.e., the steam boilers, turbogenerators, turboblowers, and turbocompressors.

In conclusion it can be established that the decentralized preprocessing of data, with the help of small computing units, is efficient even in a large enterprise that is equipped with central computers of suitable capacity, and a network of interconnected terminals. However, the small units must perform the following functions: to supply only the information that the user needs at the given level of management; to supply this information on schedule and with the necessary periodicity; and to present the results in a form suitable for further decision-making.

1014
CSO: 2402/10

BULGARIAN COMPUTER INSTITUTE DIRECTOR DISCUSSES ACTIVITIES

Sofia TRUD in Bulgarian 11 Mar 86 p 1

[Article by Engr Tsono Tsonev, director-in-chief of the Central Institute for Computer Equipment and deputy general director of the IZOT DSO: "The Tomorrow of Electronic Computer Equipment"]

[Text] "To improve the structure of electronic computer equipment..." is the statement found in the draft of the theses of the 13th BCP Congress. This brief phrase implies an enormous content and from it derive exceptionally important tasks for the IZOT DSO [State Economic Trust for Computer and Office Equipment] and its leading engineering-introduction organization, the Central Institute for Computer Equipment [TsIIT]. Because the present design developments and production decisions on which the institute collective is at work involve the tomorrow of Bulgaria's electronic computer equipment.

The scientific and technical revolution in our country is gaining pace and urgently dictates new demands on the national economy including "for highly automated, scientific-intensive and resource-thrifty types of production based on advanced technologies." As many are aware, electronic computer equipment at its very essence is the agent of scientific and technical progress and at the same time is the accelerator of this in other areas of the national economy. From this derives the great responsibility which the TsIIT leaders and specialists bear to the party and state.

There have been real results and successes achieved by the institute prior to the 13th BCP Congress. During the years of the Eighth Five-Year Plan, around 600 products and close to 30 new and modernized production methods have been developed. With the introduction of such major scientific and technical achievements as a subsystem of high-capacity magnetic disk memories, a magnetic tape group entry code memory, the problem-oriented Inforeg device based on the IZOT-1016S microcomputer, the standard matrix calculation processor, a range of microprocessor systems and many others, over the five-year plan, the total economic effect has exceeded the planned 200 million leva. The realized economic effect merely from the introduced inventions is more than 600,000 leva. With the active aid of institute specialists, the quality of the produced product has been improved and this has made it possible to establish the position of Bulgaria as one of the leading CEMA countries in this area.

The development of a number of new more modern and higher quality products has been completed or is about to be complete. For example, the modernized microcomputer universal IZOT-1016M1 computer system designed for automating production control and scientific research in the spheres of services, transport and so forth. The production list of IZOT DSO will be supplemented by 16 separate professional personal computers for processing text and digital data (IZOT-1036S), for graphic information (IZOT-1037S) and for work in the telecommunications networks for the system of SM EIM minicomputers. Through the local IZOT RING network they can link up and exchange information with a higher class of computer.

An innovation for the products developed by the institute is the image processing system known as SVIT-IZOT-1060S as shown (as the other mentioned products) at the autumn technical fair in Plovdiv in 1985. Also of interest are the new video terminals for the ESTEL teleprocessing systems, the memory of the ES-5088 miniature floppy magnetic disk, a series of magnetic tape cassette memories, the IZOT-6402S digitizer and many others.

These products make a real contribution to the development of flexible automated production systems, automated work areas for engineer designing, integrated administrative and other basic equipment for full automation.

At our institute, we are not in the habit of talking about the future. "Do and show" is the motto to which most of the leading specialists adhere. Even for the most modern 45th-generation electronic computer we only "patted ourselves on the back" after it had proven its workability and was properly assessed not by us but by world-renown scientists. But this is a success which convincingly demonstrates the increased capabilities of the TsIIT collective over the past 20 years since the founding of the institute. This instills confidence that the task tersely stated in the draft of the Theses of the 13th BCP Congress "the production of electronic computer equipment will increase around 2-fold and microcomputer equipment by over 3-fold" will be carried out!

10272
CSO: 2202/13

FRENCH EVALUATION OF GDR'S LEIPZIG FAIR

Paris ZERO UN INFORMATIQUE HEBDO in French 1 Apr 86 p 36

[Article by Josip Rajman: "GDR: Leipzig Fair; An Evaluation of East European Products"]

[Text] From 16 to 22 March, 9,000 companies covering some 40 fields of activity showed their products to about 500,000 visitors from some 100 countries.

Traditionally, the most recent hardware and software produced by socialist European countries are exhibited at the Leipzig fair; they are made by Isotimpex in Bulgaria, Petrimpex and IGV in Hungary, Elwro in Poland, Electronum in Rumania, Elektronorgtechnika in the Soviet Union, Kovo in Czechoslovakia, and Unimatik in Yugoslavia, to name just a few.

For the host country, this is also an opportunity to give others a general idea of its own products. With its wide range of computers and office equipment, the GDR manufactures and exports each year hundreds of thousands of microprocessors, thousands of robots and even software. Modern operating systems are also presented, such as Mutos, the equivalent of Unix, CSP 1700 and MRT 1700, respectively compatible with CP/M and RMX 86. There are also new specialized software packages for the metallurgical, rubber or building industries, etc.

The GDR Data-Processing Association is bent on developing operating systems architecture and technology, encouraging program creation and exchanges, artificial intelligence applications, improved training for data-processing personnel, etc. Over 100 specialized software packages are available.

The most powerful system of the Robotron company (over 70,000 employees) is a dual EC 1055/1055 M processor with a memory capacity of up to 8 megabytes [8-bit bytes] and a speed of 5.2 million floating-point operations per seconds (and, in parallel, over 2.6 million control operations). This extensive line of modern peripherals includes 200-megabyte disk drives, 2 line printers and a symbol generator.

There is a series of basic commercial systems, the 64-K to 256-K A-640 for data acquisition and retrieval, for databases and for local and remote data

transfer, etc. The A-6422, designed for factories, can include four subsystems of 60 terminals each.

Soviet-British Collaboration for Halley

A CAD/CAM (A-6454) workstation presented at the show will support four different basic software: for graphics, graphics with a digitizer, geometry and data control; and one image processing system in three different models (A-647 1/2-2-3), another for digital image processing (512 x 512 pixels), another identical but high-speed 1-megabyte model, and a combination of four such systems, each with an on-screen window of 512 x 512 pixels.

An A-6472 model is used by the Soviet Space Research Institute for a program on Halley's comet, and by a British company to detect aircraft wheel defects.

The 649 1/2 systems are designed for the industry: 4 operating systems and 40 different peripherals can be used. A modular workstation, the K-8915, integrates various functions: as an intelligent terminal center, as a programming unit for microcomputers, as a central system to record production operations, as an encoding/decoding unit, as a scientific desk-top computer.

The 7100 computer, designed for the office, will process accounting, planning, word processing, simple graphics and, as a terminal, teledata processing. It has a memory capacity of 128 to 640 K and an external storage capacity of 1 to 12.6 megabytes (a 10-megabyte disk is included).

Off-Line or Distributed Data-Acquisition System

The A-5220 on-line or off-line data-acquisition system possesses up to eight input points. The 16-bit K-1520 microcomputer is built around the U-880D processor (the equivalent of the Zilog 80). Manufactured in five versions with 4 or 8 K of memory, it is used for distributed data processing.

In addition to the many general-purpose intelligence and interactive terminals, some of which with automatic diagnostic (series EC-7920M), there are many dedicated machines such as the K-8927 designed for booking and ticket sales (112-K RAM and disk drives); the K-8924, with a similar capacity, designed for banks and savings banks; the QBG-20 system prodiving 8 colors and 128 symbols for semi-graphic or alphanumeric data; the K-8901 for production and inventory control (6-K PROM, 10-K RAM, 16 data input-stations). The K-8172 local data-transfer unit operates synchronously and asynchronously at a speed of up to 19,200 bauds over a 2-km distance and 1,200 baud over 30 km. The control unit testing data-transfer quality through modems and other devices operates at 600 to 19,200 bauds.

There is a variety of printers: daisy-wheel printers running at 40 cps, for enhanced printing quality, at 10/12 cpi; needle printers with a standard speed of 200 cps and a letter-quality speed of 150 cps. Three thermal printers are also available (with 2 lines of 16 cps to 30 cps for 80-character line lengths).

As far as graphics equipment is concerned, the A-5510 console with digitizer is particularly interesting. The device can memorize the structure of a drawing, alter it, identify it and manipulate it.

The A-5603 microprocessor graphics workstation operates over 890/1,300 mm. The K-6418 plotting table for mini- and microcomputers is currently operating on two coupled systems that are linked on line. It has 500 bytes of buffer memory and can draw on an A3-size sheet (297 x 420 mm) at a speed of up to 24 cm/s.

The K-6710 OCR reader works either with a lightpen or by inputting the text through a reading window. The OCR text can be prepared on four peripherals, including a typewriter and an OCR line printer. A convenient device (2.5 kg) is used to enter and read data from small magnetic strips or plastic cards (K-6501).

Of the many and varied voice systems (series K-7800) some can recognize 50 to 100 spoken words. Using the keyboard, one of them can even be made to repeat 16 preprogrammed texts, each of which consists of 32 parts. As an option, it is possible to connect 256 users, 16 of which can be served simultaneously.

As for data recording media, they comply with international (ISO) standards and include cassettes, minidiskettes and hard disks (of 68, 110 and 160 megabytes) as well as products imported from other socialist countries in the context of OEM equipment exchanges.

There is a wide range of typewriters, from the portable machine to the electronic model; we should mention the Erika 700 which will accept thick documents--up to 8 mm--and the Cella, which can type on rigid materials, like book covers, passports, etc., and weighs only 4.6 kg with its case.

9294
CSO: 3698/425

INTERNATIONAL TESTING OF GDR ROBOTRON PRODUCTS

East Berlin NEUE TECHNIK IM BUERO in German No 2, Mar-Apr 86 p 37

[Article by St. Roethig, engineer, Soemmerda]

[Text] From 11 November to 22 November 1985 and under the critical eyes of an international board of examiners with representatives from the People's Republic of Bulgaria, GDR, PR Poland, USSR and CSSR, joint SKR-tests [System of Small Computers] were performed in Dresden on products of the VEB Kombinat Robotron.

Emphasis was placed on testing the personal computer robotron 1715 (Fig.). This test constituted the basis for incorporating robotron 1715 into the system of small computers (SKR) under the code CM 1904. Among others, the work station computer robotron A 7100 (CM 1910) and the diskette drive K 5600.20 (CM 5640) were also tested.

In addition, the floppy-disk oriented operating system SCP, the operating system of robotron 1715, was incorporated in the SKR under the designation MIKRON.

With the introduction of robotron 1715 into the SKR an equipment system was created for use in commercial sectors to rationalize data communications, which replaces the previous Technik robotron 1711, robotron 1720 and A 5110 (CM 1617) and opens up new areas of application and potentials. Corresponding to the international trend, the approach of an instrument assembly in the form of a modular desktop unit was taken.

Two versions of robotron 1715 were tested. The first version was comprised of the basic unit (system unit with two floppy disk drives, monitor, keyboard) as well as wire matrix printer K 6311 (CM 6329.01). The second version was provided with an additional module with two standard disk drives.

It is the objective of an SKR-test to

--evaluate the technical construction and operating parameters of the test units to determine the suitability of these units within the system of technical devices of the SKR,

--demonstrate the reliability and quality of the product,

--examine that the units are in agreement with the normative-technical documentation that is mandatory in the SKR,

--examine the composition, completeness and quality of operating documents.

The acceptance into the SKR of robotron 1715 under the designation CM 1904 constitutes proof of required technical parameters, the functioning of the unit under certain conditions of use, the quality and reliability as well as that this unit is ready for production.

However, passing the SKR-test does not only signify its suitability as an individual unit but also the possibility of being used within the entire system of small computers by guaranteeing the capability of being interconnected with other units of the SKR, including SKR-devices from foreign production. Among others, it was determined during the test that coupling capability existed for remote data processing of the CM 1904 with the microcomputer K 1630 (CM 1630) produced in the GDR.

On the basis of testing methods agreed upon within the framework of the council of the head design engineer of the SKR, the following examinations were performed during the SKR-test, including the preceding national tests:

--Adherence to and achieving the basic parameters required for development

--Interfaces and terminal capability

--Assembly interchangeability and compatibility

--Reliability

--Proof of functioning in case of malfunctions in the supply voltage and frequency

--Resistance to mechanical and climatic effects

--Mass, dimensions, noise level

--Insulation resistance and safeguards

--Inspection of packing

Robotron 1715 (CM 1904) passed all of the subtests. It performed particularly well under continuous testing and demonstrated its high reliability.

According to the "Regulation on the Performance of Joint Tests on Devices of Computation Technology" of the multilateral government committee for data processing of the socialist nations, the "technical specifications for export shipments" were submitted for the personal computer CM 1904 for SKR-testing in Dresden and were evaluated by the international specialists. These

delivery terms and conditions are based on the evidence of engineering and application parameters of the joint test and represent an essential foundation for the export of this instrumentation into the socialist countries.

With CM 1904 (robotron 1715) a unit was introduced for SKR-testing, which, by international standards, can hold a candle to devices of this performance class. It had a convincing effect due to its engineering and application parameters, its reliability and quality.

13011/12859
CSO: 2302/10

ROBOTIZATION IN POLAND COMPARED WITH OTHER COUNTRIES

Progress, Problems

Warsaw PRZEGLAD TECHNICNY in Polish No 8, 23 Feb 86 pp 6-8

[Article by Donat Zatonski: "Robotization: Waiting For the Robot"]

> [Text] The vision of our modernized automated industry was as follows: in 1978-1980, 1200 robots were supposed to be installed and these included 450 all-purpose (complex) and 750 simple (specialized) models while in 1981-1985, Polish industry was supposed to receive 2600 complex robots and 3400 simple ones. The basis of these predictions was Decree Number 8 "On the growth of production and the uses of industrial robots" signed on 29 March 1978 by the minister of machine industry at that time.

When in 1981 it was evaluated how well these plans had been implemented, it turned out that out of the planned 1978-1980 production of 380 complex robots and 775 simple robots, only 57 and 530 of each group respectively were actually produced. Industry is using only 201 robots, 30 of which are complex models. On the basis of what has been achieved over the last 10 years, it is estimated that about 600 various robots and manipulators have been built in Poland. About 300 of these have been installed in production lines while attempts are being made to similarly install another 100. We must regard these figures with some scepticism because there is no way of knowing how many are really operative and how many are simply "in place". Furthermore, a considerable number still remains unpacked. Plant directors today will not make any risky decisions and are resisting robotization even when they have a shortage of workers (and there often is a shortage!).

This is nothing to joke about. If two to three years ago the cost of purchasing and setting up a robot was about 20 million zlotys and an entire robotic production section cost more than 30 million, then the obvious conclusion is an unhappy one.

The costs of hiring workers are incomparably less. Assuming that a worker is paid 30,000 zlotys per month (including the yearly "thirteenth month" bonus), we see that the cost of a robot is recovered only after 50 years! For that

reason, it is hard to forcefully incorporate robots into existing production structures in which the economics (according to today's figures) for such a measure are not too favorable. One cannot argue that this has been profitably done in other countries either. That may be the case for them. For example, it has been estimated that in the USA, the average robot operating costs are $4.80 per hour which is less than one-half of what an assembly line worker receives.

It is obviously demagoguery to condemn any effort at achieving this sort of technological progress or to renounce the use of robots in general. We must understand that there is no turning back. We do make some halting progress in a wasteful manner but what we must do is achieve some real advances even if we have to crawl forward, all the more so as we have an overabundance of places in which the working conditions are harmful to health and in which robots must be used regardless of their cost.

Man Was Guilty But the Robot Was Hung

In Poland, the place in which robots look their best at work is the Passenger Automobile Factory at Zeran in Warsaw. The Italians equipped the Fiat 125p and Polonez body assembly lines that we purchased from them with 15 robots produced by the firm of Unimation. There are 1595 welding points in the Polonez production line and 384 of them are operated by robots, one of which can produce 14-39 welds. Therefore, 12 robots can do the work of 17 people.

The Olkusk Enamelled Dishware Factory has a more modest level of robotization consisting of 6 R-2000 robots made by the Tralifa firm. These robots are used for spray-enamelling of bathtubs and drainboard sinks. These are two typical examples of robots purchased and put into operation during the Gierek era.

I think that the Design Research Institute in Pruszkow deserves to have the right of precedence in the Polish robotization of industry because it is the machine-tool industry that has developed the most modern automation processes, i.e. ,manipulators and industrial robots. The first robot created at the Center, the PRO-30, had a load capacity of 30 kg, hydraulic drive and could be programmed through instruction, i.e. by remembering commands given under manual operation. This model was designed to operate machine tools and production sections incorporating these robots were first exhibited at the Poznan International Trade Fair in 1978. By the end of 1981, 46 of these robots had come into being. Work is also being done today on flexible production systems.

The Institute of Precision Machinery in Warsaw taken such an approach in this area. It was assumed that the starting point of a robotization chain is work positions in conditions very harmful to human health. The institute has designed a family of RIMP robots (manipulators). By the end of 1981, 110 RIMP-401 robots were built, only one-third of which were installed, and 10 RIMP-1000 robots (one worked).

The MERA-PIAP Industrial Institute of Automation and Measurement Technology has worked out its own design for the PR-02 simple robot, about 320 of which have been manufactured. However, the institute has not been credited with deciding to purchase a license from the Swedish firm of ASEA for five million dollars, For this we received know-how, 10 fully-assembled and 17 unassembled IRb robots, the right to train our personnel in Sweden and maintenance and supervision by the firm's specialists in Poland.

At that time, the IRb robot was one of the newest forms of technology but the license covered only what the Swedes had manufactured. The most important element of the robot, the so-called wave transmission had to be bought from someone else just as the bearings and some of the more important mechanical parts. The institute has estimated that in the future, once we have used up all of the Polish counterparts, it will also be necessary to buy foreign-made parts, the dollar cost of which will be somewhere around 15-16 percent of the cost of the robot. However, the danger of the situation goes even further than that.

The license was bought at the end of December 1976 and was valid until April 1984. The entire business fell apart like a sand castle. At the beginning of 1983, the license contract with ASEA was cancelled. By this time, three IRb robots had been produced and these could not be certified by the firm. There is no way of listing all of the causes of this disaster. Restrictions and a lack of money are only part of the problem.

A conflict emerged between the Institute of Precision Machinery [IMP] and the PIAiP [expansion unknown] about their authority over key problem number 06.6 "Industrial robots and manipulators", over money and the concepts and future of the nation's resources for the manufacture of robots. Therefore, the money was divided as follows: 27.7 million zlotys were received by PIAiP, 17.5 million went to IMP, 9.8 million to TEKOMA (also the designer and producer of the manipulators) and 7.4 million zlotys went to the Central Machine Toll Design office. This money did nothing to alleviate the existing economic crisis and "Polish hell" in which a disreputable role was played by the ministries of machine building and higher education and technology.

There remains unanswered the question of how it was possible to buy a license a few days (literally) before the formal introduction of an economic maneuver drastically limiting dollar expenditures knowing that such a license will long require such expenditures. It is obviously untrue that one can realize a program of mass robotization without years of personnel training, preparation of organizational systems and the settling of pay scales, material costs, etc. The robots must be situated in an automated environment where the technical level is high enough to accomodate such technology. One cannot compel "success" by accelerating the introduction to production of unfinished prototypes (as in the case of the RIMP-401 robot which only barely introduced was sent into production where all of its defects were multiplied).

If I am accused of telling just the same old story, I can only say that it is just to keep everyone from forgetting it! One can in theory learn from

mistakes but it would be better to start with the ABC's and answer the question of what robots are to be used for.

Playing in the Dark

The director of Hydromat, Edmund Nowak, has decided to cure Polish robotics of its ills. This is a very controversial hero and one energetic to the point of danger, which is a characteristic highly-esteemed in our times. He therefore gave up his company's production slogan of "1000 robots!". He stood up for the lost ASEA license; two types of robots with load capacities of up to 60 kg are in production today and a third one with a load capacity of 90 kg will follow. Smaller robots area also being considered.

A year ago, he was given a somewhat naive question: "Do you think we can get involved in international technological growth and that we still have another chance?". His answer was: "As far as our own domestic work goes, we have lost our last chance. To put it simply, we will not be able to pride ourselves in having done anything with these robots. We must use other people's designs if they are good ones. ASEA has good designs. If we succeed in making a better design, then after some time I will be able to introduce it and offer it to different buyers.

"Poles still have a chance to move forward. I see this chance in departing from our reliance on centralized research bureaus. We have to go to industry, organize groups that can quickly adapt a robot to production needs and throw ourselves into an enormous amount of work..." (PRZEKROJ number 2073).

And so much optimism. We should have enough for now and later (and for the responsibility of Director Nowak). The adjacent annex shows that the life of an optimist is not an easy one and that even he makes above-average demands.

Aside From Gossip

Even if they are not too exact, the statistics do not bode well for us. The total number of robots in the countries in which these devices are already commonly used amounted to about 70,000 (at the start of 1984). More than 60 percent of these robots were found in Japan, 14 percent in the USA and 7 percent in West Germany. The most common uses of robots are in assembly work, the putting together of small component such as integrated circuits and watches, welding and founding, painting and surface finishing such as grinding. Many robots are used to transport materials, parts and equipment.

Throughout the world, about 500 types of industrial robots and manipulators are being manufactured by 350 different firms (250 of which are Japanese, 50 American and 50 European). The leading firms are Kawasaki, Mitsubishi, Cincinnati-Milacron and ASEA. In 1990, the majority of robots will be equipped with adaptive and sensory guidance systems.

The Japanese program foresees a turn away from presently-used concepts for using robots in large factories. The robot automation of small factories

should make small-lot production just as profitable as mass production. This would be a significant step in the field of competitive battle.

The CEMA nations must take part in this race. It has been estimated that by the end of the 1970's, Poland, the GDR and Czechoslovakia had 300 robots each, Bulgaria had 250 robots and the USSR had 9000. The picture this year is a different one: the USSR has 40,000 robots, the GDR has 8000, Czechoslovakia 3100 and Bulgaria has 2300. It would be hard to say that Poland has anything like a leading place among these nations. The is little chance that will we be able to catch up with our neighbors by the year 2000 which is when all of the CEMA nations are planning to have a total of 200,000 robots.

In June 1982, the "General agreement on multilateral cooperation to work out and organize specialization and cooperation in the production of industrial robots" was signed in Budapest. Unfortunately, this document has not helped us to solve any problems but brought about the latest explosion of internal debates with known consequences.

Its seems that the economic and industrial strategists of the GDR are working most consistently. They are planning to introduce about 42,000 robots to industry there. In several countries, they have bought a few of the locally-produced robots (including the PRO-30's and RIMP's in Poland). They have used their experience with these various foreign designs to produce their own and this led to the ZIM series. In 1982, 190 of these ZIM's had already been produced and most of them were being used in industry. The Czechoslovakians are carrying out a program whose cost is estimated at 500 million korony. Under this program, they will have produced 3500 robots and manipulators by the end of 1985 and another 13,000 by 1990. For some time, the Bulgarians have taken pride in a good pneumatic robot used for painting and are exporting this model to the USSR. They build this robot under a license purchased from the American PRAB firm.

The scale of achievements in robotics in the USSR is much greater. More than 100 types of robots have begun to be used in various areas of industry, mainly with foundry machinery, presses, quenching tanks and galvanizing tanks. When the decision was made about which type of robot to mass produce, a Polish proposal (of November 1982) for a sublicense on the IRb robot was also considered. However, since this robot had not been put to use in our own industry, our Soviet partners did not want to risk using it themselves and therefore bought a license from the West German firm of KUKA.

Robot production in the USSR grew from 3700 in 1981 and 5400 in 1982 to nearly 7700 in 1983. As planned, by the end of 1985, the total number of simple and complex robots has exceeded 36,000. With regard to the latest measures to intensify the Soviet economy, we can guess that robots and electronics have played a leading role in the restructuring of Soviet industry. It is enough to say that all of our CEMA partners are managing much better than we are. Above all, they are counting on themselves and if they have to deal with others, they only consider those that have something to offer.

Two Barriers

In our present situation, all moralizing sounds like a bad joke but certain obvious points must be repeated to the point of boredom. A robot is a complicated device made up of subassemblies that must be of the highest quality and more importantly, easily attainable. These components include the drive, control systems, sensors, visual devices, etc. If Poland is to be able to obtain these components, we must first out our industry on the right level and concentrate our dissipated resources to make the scientific and research establishments working in robotics sufficiently dynamic and efficient.

We have already encountered the second barrier. Potential users must be ready to accept the new technology. We must therefore prove not only the economic justification for such a step but also the eventual necessity.

Everything therefore indicates that that without assistance and state funding in at least the first stage of robotization, we will not be able to accomplish anything.

Other CEMA Countries

Warsaw PRZEGLAD TECHNICZNY in Polish No 10, 9 Mar 86 pp 12-13

[Article by Donat Zatonski: "Annex, Or the Achievements of Others"]

[Text] On rereading my article "Waiting For the Robot" in PRZEGLAD TECHNICZNY 8/86, I discovered several mistakes. One of them was that I too laconically presented the achievements of our neighbors. The figures I quoted so glaringly showed how the position of Polish robotics contrasts with that of other countries such as Czechoslovakia and Bulgaria. In recent years, I happened to attend machine exhibits in both of these countries.

By One's Own Forces

Since 1981, the leading role in Czechoslovakia's robotics program has been taken by the Center for Industrial Robots and Manipulators in Presov. This city is 36 kilometers distant from Kosice. The suburbs of Presov contain new industrial and research facilities including the Industrial Machinery Research Center which is working not only to coordinate the all work on robotics within Czechoslovakia and also does the leading design and construction work in this field. This work is done on the order of the government or of individual factories. The center also decides whether the use of robots or manipulators in any individual case is economically justifiable and feasible. Since 1976, the center has designed many different robots and manipulators with lift capacities of from 1 kg to 160 kg. Today, about 1000 persons are employed here. Half of them are directly employed in the center's research and production divisions and 35 percent have higher educations. The Czechoslovakian robotics program plans for the installation of about 3000 robots and manipulators in industry by the end of 1985 and the creation of 1500 fully-automated technological lines. Under the same plans, Czechoslovakia will have produced more than 10,000 robots and manipulators by

1990 and their chief function will be use in automated production lines, 4000 of which are to be built.

Since the Presov Institute is in fact the leader of robotization in Czechoslovakia, it also supervises the entire cycle of robotics work from the birth of a design, through the building of prototypes and production through the new model's installation in industry and service maintenance. The point of departure for the robotics program was the assumption that its foundation would be domestic technical ideas and the country's own scientific, research and production work. Therefore, no foreign licenses were purchased.

This is how the M 63 manipulator (lift capacity of 63 kg) was created. The M 63 has been successfully used in a Kosice factory producing various types of sheet metal. The APR 20 robot belongs to the second generation of robots and is equipped with sensory systems and the ability to "think" and "adapt". It is primarily designed for welding (electrical arc welding). For the past year, unified manipulators have been used at the Automotive Industry Works in Kopsivnice to weld cabins for Tatra-815 tractors.

From the beginning of 1981 to the end of 1984, 200 robots and manipulators have been designed at the Presov center. In 1985 alone, the production reached a level of 100 of these devices and should exceed a figure of 2000 by 1990. The manufactured robots have been put together to form the longest fully-automated technological line seen so far at a pressure pump works in Velesin. Eight industrial robots work on this line.

The Presov center has been trying to adapt the RS-3 control box (with microprocessor) to work with Polish IRb-6 and IRb-60 robots and this is one of the first steps toward Polish-Czechoslovakian robotics cooperation. With regard to cooperative work in this field, Czechoslovakia's premier partner in this field is the USSR and there has even been established a joint Czech-Soviet bureau (the Robot association) working on the design and building of robots and manipulators used by both sides.

With License Support

There is a similar partnership between the USSR and Bulgaria. The two countries have come together to form a science and production association combining the Soviet Red Proletariat plant and the Bulgarian Beroe Works.

Beroe is a robotic science and production works in Stara Zagora. Its well-developed electronics factory supplies systems for industrial robots and hydraulic and pneumatic equipment is manufactured in nearby Kazanlyk. The Beroe Works has long produced metal-cutting machine tools and in 1974 began to produce for the Soviet Union (for the Kamaz Automobile Works) manipulators of its own design.

The intensive development of this area of industry was made possible by the government program in which the Beroe Works became the most important research and production object and its component Robotic Scientific Research Institute the coordinator for all work in this field. By the end of 1984, the works had produced 1000 manipulators and robots. In the beginning, these were robots

that transported certain elements for metal-cutting machine tools. This series includes the Pirin PM 40, PM 80, RB 120 and PM 160 gantry robots that have lift capacities of 40-160 kg.

The latest series of robots is the RB 230 controlled by a built-in microprocessor unit. These are chiefly used in automated production lines. They have a considerable load capacity of 30-540 kg. The RB 211 robot can replace workers to perform operations under harmful conditions and is able to paint, lacquer and coat metal surfaces with thermal insulating. In 1985, the Warsaw Passenger Automobile Factory bought two RB 211 and RB 231 robots and a PM 40 manipulator.

The Bulgarians show much ambition in their work on robotics and this is seen in the consistent way in which they act and in their innovations. For example, at the Plovdiv fair, they displayed the prototype for a plasma-jet robot which will go into production this year. Last year, the Beroe works produced many laser robots for cutting sheet metal. However, their main achievement is not even in their innovations but in their automation of production lines and flexible automated systems. Many factories have already built production lines according to this system. These are lines consisting of machine tools, robots and manipulators with automatic transport and storage systems. The Beroe Works also have such a system made up of 43 different machine tools. The line works around the clock and during the third shift, the work is done entirely by robots under the supervision of three persons at a computer.

The Bulgarian program for automating production processes has been realized with such verve that it must certainly be very costly. They have also made use of Japanese and American licensing for their robots and manipulators.

It is not pleasant to realize that Polish achievements in robotics are so insignificant in comparison to those of others. We must remember that according to the "program for scientific and technical cooperation in the creation of unified components and industrial robots of fixed design" for the industries of the CEMA nations as well as within the Interrobot organization, Poland has been given the task of specializing in welding robots. The Bulgarians are responsible for robots for the application of coatings and the assembly of individual components for the electronics and machine-building industries. The Hungarians are specializing in robots for monitoring and measurement operations and the assembly of devices for the tool industry while the Czechoslovakians are responsible for robots used in the foundry industry and for construction work.

Out of the present achievements of our community, it is worth drawing attention to the following: gripping and holding devices have been designed and unified, materials for various types of robots have been standardized, components and subassemblies have been standardized and methodological instructions have been worked out for designers, technicians, etc. Many designers have undertaken the realization of a complicated program aimed at

producing a series of electromechanical robots equipped with various types of sensors such as the so-called technical eye.

According to specialist predictions, 30 percent of all robots will by 1990 be used in flexible production systems such as those that have already been set up in Bulgaria and the GDR.

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SPECIFICATIONS OF NEW BULGARIAN METALCUTTING MACHINES

Sofia TEKHNICHESKO DELO in Bulgarian 22 Feb 86 p 14

[Article: "Silistra Metalcutting Machine Plant"]

[Text] The Silistra Metalcutting Machine Plant is the only enterprise in Bulgaria specializing in the production of bow and band cutting machines.

The following articles will be produced in 1986 for the needs of the international and domestic markets.

Bow Cutting Machines

ON 165, semi-automatic, with a maximum cut off material diameter of 180 millimeters.

ON 166, automatic, with a maximum cut off material diameter of 160 millimeters.

ON 253, semi-automatic, with a maximum cut off material diameter of 280 millimeters.

ON 254, automatic, with a maximum cut off material diameter of 250 millimillimeters.

ON 401, semi-automatic, with a maximum cut off material diameter of 400 millimeters.

Band Cutting Machines

OL 260 B, semi-automatic, with a maximum cut-off material diameter of 260 millimeters.

OLV 4, vertical band machine designed for tool shops and departments.

OL 400 A, automatic, with a maximum cut-off material diameter of 400 millimeters.

OAD 31 disk cutting and grinding machine.

Products recently added to the plant's product list are numerically controlled column band cutting machines, models OLK 400 A and OLK 260 A, designed for cutting blanks from round and sectional sheets of ferrous and non-ferrous metals and alloys.

The high-capacity numerically controlled band cutting machines will be used at machinebuilding enterprises both for producing blanks in wide assortments and short production runs and for incorporation into automatic production modules and lines for production of blanks in long runs.

Following are the basic technical data of the products.

	OLK 400 A	OLK 260 A
Maximum cutting diameter	400	260
Automatic feed length		
Single feed	50-500 mm	57-500 mm
Repeated feed	to 5000 mm	to 5000 mm
Output in cutting St 45 Fn 150 with bimetallic tool	100 cm^2/min	75 cm^2/min
Cutting speed (continuous)	10-150 m/min	10-150 m/min
Duty feed rate (continuous)	10-150 m/min	10-150 m/min
Cutting band dimensions	38x1.3x160 mm	32x1.1x5400 mm
Power of primary motor	7.5 kv	5.5 kv
Control method	programmable controller	
Number of programs	9	9
Weight	3000 kg	2000 kg
Overall dimensions:		
Length	2850 mm	2700 mm
Width	2520 mm	2520 mm
Height	2210 mm	2030 mm

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BULGARIAN METALLURGICAL TECHNOLOGIES DISCUSSED

Sofia BULGARIA TODAY in English No 459, 1986

[Article by Angel Bonev: "Research Multiplied in Production"]

[Text]

Strategic Technologies in Bulgarian Mechanical Engineering

Powder metallurgy, centrifugal casting, hydroplastic processing of prime materials, lasers, counter-pressure casting – these are today's strategic technologies brought to the fore by the objective laws of the revolution in science and technology. I should say right away that some of these highly-efficient methods for processing metals are known in the most advanced countries, while others are original Bulgarian developments and new to world practice, which will revolutionize a number of processes in mechanical engineering and metallurgy.

Today's story is about three of the strategic technologies that have already successfully passed the test of application, and whose good results no one in our country would try to deny, since practice has confirmed it completely.

Hydroplastics, or Fluid Metal

Hydroplastic metal processing is an original Bulgarian method devised by scientists and specialists at Gabrovo, where the youngest research-and-production corporation named after the method is developing headlong. What actually is this method? It is basically quite simple, and can be easily grasped by the layman. Imagine a steel tube about half a metre in length, with a shiny inside surface. Do you have even a vague idea of how many processes it has to go through to reach this state? It comes from the iron and steel works cold-rolled, black, and without any precise measurements. First it has to be lathed on the inside, then smoothed with a burnisher, and finally worked by special rollers to achieve the required smoothness. These operations are very time-consuming, and require the labour of at least three highly skilled workers.

If four years ago someone had said that all this could be done in just ten seconds, steel-processing experts would probably have advised him to see a psychologist, so incredible it seemed then. Today, however, the tube-processing machine devised in Gabrovo 'disgorges' one every ten seconds. The processing is carried out at a low temperature, because high-carbon-content steels have very low plasticity at normal temperature. That is why the machine is designed to press the part with unusual pressure – several thousand atmospheres – to make it plastic, and the metal looks as if it's become a fluid. Under these circumstances it is not hard for the tool to bring it to the required dimensions and smoothness, and that without any loss of material, since the surplus steel simply goes to lengthen the part: by traditional methods it becomes iron filings.

Looks simple, doesn't it? But to achieve this simplicity, three complex scientific problems had to be solved: plastic processing, the hydraulics of extreme pressures, and 'tribology' – a new science studying friction in the region of contacting surfaces. Even today the method has its opponents, although their numbers are dwindling, while the method is being increasingly confirmed by practice. The Balkan Works in Lovech is already using a special complex for the production of cylinders, while the Podem Works of Gabrovo is using a computer-aided manufacturing system for cogwheels. This year the mechanical engineers in Pleven are to manufacture nine more machines for domestic use, for the USSR, for Czechoslovakia and other countries. Experts claim that the new method can be applied in the manufacture of about 30-40 per cent of all parts in mechanical engineering, economizing half of the metal invested at present. That is why interest in this method, which has also been shown by a number of Western firms, is so justified...

Metallurgy Based on...Powder

The combination 'powder metallurgy' is only unusual at first glance. It is enough to go and see specialists at the Metal Ceramics Research-and-Production Combine in Sofia to see what lies behind this technical term. It actually encompasses a complex technological process, which results in prime materials with qualities that are built in beforehand. In all cases, the basic material is powders. Sometimes they are pure metals, while at others they are a mixture of metals and non-metals, which are first pressed, and then subjected to thermal processing, which bonds the particles in such a way as to give the material the required qualities, the very qualities demanded by mechanical engineering, chemistry and electronics.

Powder metallurgy has many advantages. Experts know full well that almost all materials used in mechanical engineering, for example, and obtained by traditional methods of casting and machine-tooling, usually combine no more than 15 to 20 components. Powder metallurgy, however, can be used to combine almost all the elements on Mendeleev's table. This vastly increases the possibility of obtaining materials with hitherto unknown qualities.

The second feature which makes it particularly attractive is the lack of waste, since the method utilizes about 99 per cent of the materials invested. No classical technical process has such an insignificant waste factor. There is also great economy of energy – about double that used in traditional methods, since the heating is carried out at half the temperature of melting.

Eighty per cent of the products that are obtained worldwide using powder metallurgy are produced in Bulgaria. This now places us eleventh in the world in the volume of parts made via powder metallurgy per head of the population. In which areas are the greatest achievements? Above all in metal-ceramics for instruments. Wolfram-free hard alloys have been obtained – a new class of material for instrument-making, whereby the scarce wolfram is replaced by other elements. New super-hard materials have also been obtained. There are composition materials for semi-conductor technology. Practically the whole range of contact materials for the low-voltage industry has been acquired. A wide-ranging programme for economizing silver has been put into practice, which is a substantial breakthrough in the economical use of expensive raw materials.

The works' laboratories are now giving birth to new types of powder-metallurgy based products, which will greatly multiply the effect of science on production.

The Method of Centrifugal Casting

Centrifugal casting has been known to the world for a long time. Every metallurgical worker knows the principle behind it: the material is pured into a metal mould that rotates around its axis and which has been given a protective covering on the inside. This not only saves it from direct contact with the molten metal, but also guarantees a particular structure of the metal, and hence of the finished product. Rotation causes the centrifugal forces to press the molten metal to the furthest parts of the mould.The higher pressure makes sure that the thin walls of various parts are well filled out. Hence, too, the advantages over static casting – the products are tougher, their structure has a higher density, and there are fewer defects. Also it requires 50 per cent less input of materials.

In Bulgaria, classical centrifugal casting brought about a new method which most experts today call the basic method. It immediately showed its advantages. It is used to cast parts which afterwards have to work under extreme conditions: aggressive chemicals, temperatures of up to 1,100° C, high pressure.

The Centromet research and production enterprise in Vratsa was set up specially to apply the new method in practice. It started off with centrifugally-cast pipes for the chemical industry. Specialists at the Vratsa Chemical Works still remember how it all happened: they urgently needed active piping for their re-casting furnaces. Two ways were possible: one was to import them for hard currency, while the other was to propose that a renowned western firm order their development from ... Centromet. The particular firm agreed, but before that they wanted a special appraisal made by another western firm. The appraisal was positive, so the pipes were cast in Bulgaria. And in the years since then they have worked without any deviation from the norm. Recently the western firm ordered more active pipes from Centromet, but this time to market its production in... third countries.

Today centrifugal casting is used to produce all the thin-walled bushes needed for the Perkins diesel motors produced under license in Bulgaria. Over 20 new articles are being produced by using this method for the needs of the iron and steel industry here. Non-ferrous castings are also being made. With every passing day, centrifugal casting is gaining new horizons. In just six years 92 technological complexes have been applied in the chemical industry, mechanical engineering and transport.

* * *

The revolution in science and technology has brought these strategic methods to the fore.. One can confidently say that from the very beginning they were lavished with special attention both in planning, finance, coordination, and in their practical introduction in the economy. And today they are already having their economic effect in many spheres of the national economy, even though initially they were designated as strategic only in mechanical engineering.

And therein lies the result of the multiple application of research in production.

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- END -